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WARTIME REQUIREMENTS FOR AMMUNITION MATERIEL AND PERSONNEL (WAR--ETC(U)
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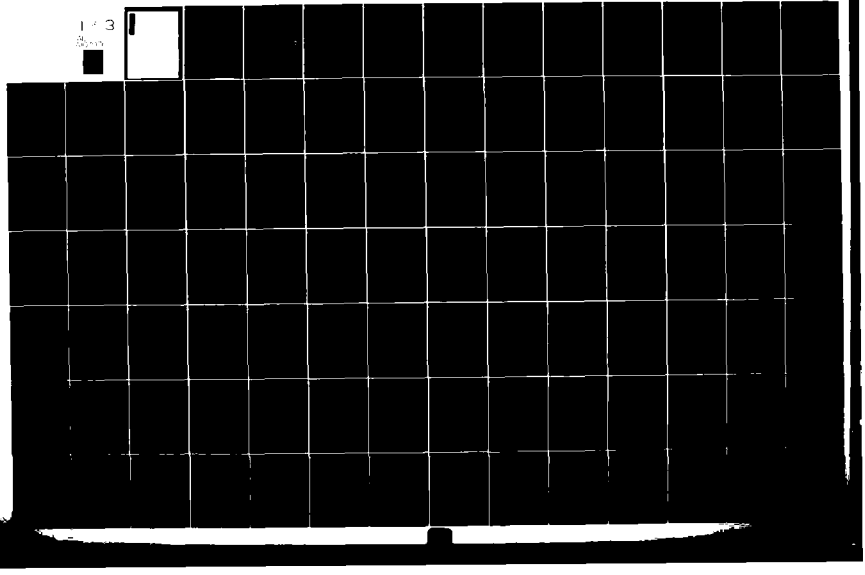

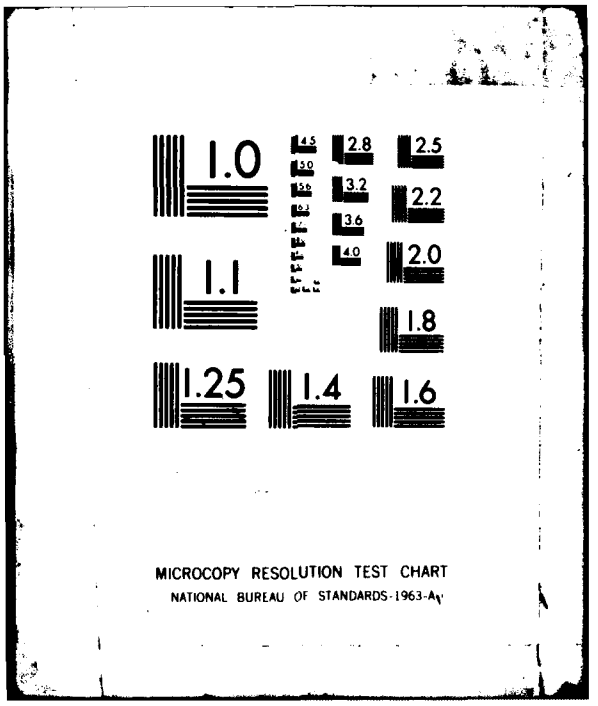
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FORTRAN	VULNERABILITY CATEGORIES	LINCODE
SIMSCRIPT II.5	CONCEPTS EVALUATION MODEL	WARRAMP
SYMWAR	COSAGE	
EQUIPMENT CLASSES	ELCON	

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

This manual provides information on the use and application of the 19 programs that comprise the Materiel Postprocessor (MPP) of the Wartime Requirements for Ammunition, Materiel and Personnel (WARRAMP) methodology. This manual provides a general overview of the methodology system followed by a user-level discussion of each program. The discussion includes a general description, data base, input and output sample program runstream for applications on the UNIVAC 1100/82 installed at the US Army Concepts Analysis Agency.

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WARTIME REQUIREMENTS FOR AMMUNITION, MATERIEL, AND PERSONNEL (WARRAMP)

MATERIEL POSTPROCESSOR USER'S MANUAL (MPP-UM)

VOLUME I

August 1981

PREPARED
FOR
U. S. ARMY CONCEPTS ANALYSIS AGENCY
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CONTRACT MDA903-80-C-0668

MATERIAL POSTPROCESSOR

USER'S MANUAL

(MPP-UM)

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APPENDICES

FIGURES

Section I

GENERAL

1. PURPOSE: The purpose of this Wartime Requirements for Ammunition, Materiel, and Personnel (WARRAMP) Materiel Postprocessor User's Manual is to document the description and structure of the software programs that compose the materiel postprocessor (MPP). Documentation includes all the component programs of the materiel postprocessor with an individual description of their structure, the data base, the UNIVAC runstreams, input data, and sample output data sufficient to provide a potential user with simple instructions and clear examples of how to prepare the input data files and execute the programs on the UNIVAC hardware.

2. APPLICATIONS: The Materiel Postprocessor is designed in total, to support analysis of materiel (major items of equipment) as a part of the WARRAMP methodolgy. Other applications may be developed based upon a user's study of the component programs and determining applicability.

3. SECURITY and PRIVACY: The individual software components (programs) are cataloged as indicated under the detailed descriptions for each program. In each case, they are cataloged in the public mode for user access. User's are asked not to modify or edit (write) in the program files. In event alteration is required for a specific purpose, a potential user should copy the program to a file under his/her user identification, and then edit the file as desired. In event of error detection during use, the user is requested to note the error by program line and forward the proposed correction to the program custodian, so that the record program may be updated. Test (sample) data, either input or output and the programs contained herein are unclassified. Users must apply the appropriate security classifications to their data files and are responsible for the safeguard of printed matter accordingly.

4. CONFIGURATION: Figure I.4.1 depicts the overall WARRAMP system. The portion of the system which this document concentrates on is contained in the heavy-lined box.

4.1 METHODOLOGY:

a. The central building block of the Wartime Replacement Factors (WARF) methodology is the Systems for Estimating Materiel Wartime Attrition and Replacement Requirements (SYMWAR) system. SYMWAR developed, from historical data, loss rates for each of 10 causes of loss, 4 combat postures, in 5 zones of the theater for 36 classes of equipment. A list of the 36 SYMWAR historical classes is at Figure I.4.2. A pictorial view of the loss rates for a particular item of equipment as developed in SYMWAR is shown in Figure I.4.3. This 3-dimensional matrix, now called the WARF matrix, contains 200 cells. The cell in the upper left front would contain the rate of loss inflicted by direct fire on that fraction of the equipment

located at the Forward Edge of the Battle Area (FEBA) and in an attack posture. By applying data on the distribution of equipment item over the five zones and combat postures, an overall equipment loss rate may be computed.

b. The portion of the WARF matrix enclosed by dotted lines in Figure I.4.3 represents the area in which, in the WARF system, simulations results are substituted for the historical data of SYMWAR. These 48 cells represent combat losses within 30 kilometers of the FEBA. That is the area in which current combat simulations have the most credibility.

c. In the WARF system, each equipment item is placed into one of three categories.

(1) Combat equipment which can be expected to suffer significant direct fire losses (tanks, APC, antitank missile launchers, etc.) is simulated in detail in close combat situations. The data developed in these sample situations are used as a basis for the assessment of losses in a theater combat simulation over an extended period of time (for example, 180 days). These theater losses are applied in the upper left corner (within the dotted lines) of the WARF matrix. The detailed combat simulations currently being used are those used in the series of studies, Ammunition Combat rates, which develop the Army's conventional ammunition requirements. The theater simulation is the Concepts Evaluation Model (CEM), used in the series of Total Army Analysis (TAA) on which the Army's force structure is based. In principle, however, any set of models could be used.

(2) Other equipment types which are not normally involved in direct fire engagements (5-ton trucks, rough terrain forklifts, radars, etc.) but which are located close enough to the FEBA to be subject to significant losses from artillery and air form the second category. They are subjected to detailed analysis through a target acquisition/fire planning/indirect fire series of simulations. The results of this process form the basis for losses due to area fire and air within the first three zones of the theater. Direct fire losses for this category are estimated from the SYMWAR historical data.

(3) The third category contains items which are not normally located in Zones 1, 2, or 3 or which for methodology limitations reasons cannot be simulated. Losses for these items are those in the original SYMWAR system.

(d) Intertheater shipping losses, losses in depots, and along the in-theater Lines of Communications (LOC) are computed as percentage add-ons to the basic theater loss rates.

4.2 INPUTS/OUTPUTS - Figure I.4.4 identifies all utilities and data currently in the Materiel Post Processor (MPP). Further it details which files are required as input to specific utilities by using "I" in the common box for the two items. Also files produced by specific utilities are identified by an "O" in the box at the intersection of the file and utility. For example if the user is required to execute the ITMID/TEMP utility from Figure I.4.3, it can be seen that the DENSITY/PROFILES, QUANTITY/PROFILES and LINCODE/LIST files will be required as input files and the ITMID/TEMP file will be produced as the output file.

WARRAMP OVERVIEW

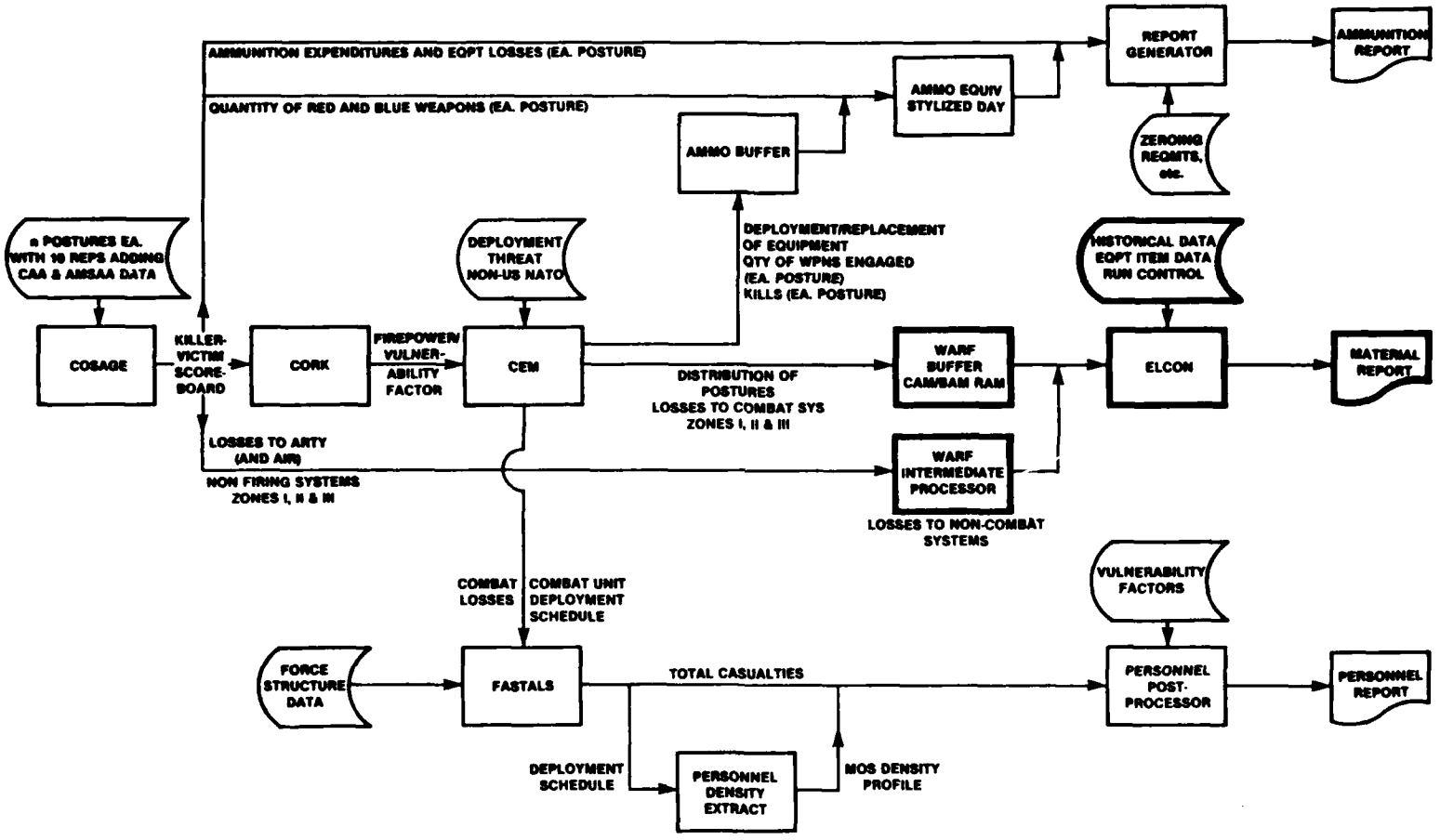


Figure I.4.1

SYMWAR

Historical Equipment Classes

1. Strike airplane
2. Surveillance airplane
3. Utility airplane
4. Airplane subsystem
5. Strike helicopter
6. Surveillance helicopter
7. Utility helicopter
8. Helicopter subsystem
9. Missile
10. Howitzer, self-propelled
11. Howitzer, towed
12. Gun, (20mm and above), self-propelled
13. Gun, (20mm and above), towed
14. Tank
15. Carrier, mortar, self-propelled
16. Mortar
17. Machinegun
18. Recoilless rifle
19. Individual weapon
20. Armored personnel carrier
21. Truck (less than 2 1/2 ton)
22. Truck (2 1/2 ton and above)
23. Trailer/semi-trailer
24. Engineering
25. Other type vehicles
26. Communications
27. Electronic
28. Searchlight
29. Generator
30. Fuel tank
31. Landing craft
32. Other, individual miscellaneous equipment
33. Other, miscellaneous equipment
34. Pumps and compressors
35. Marine equipment less landing craft
36. Mine detectors, night vision sights

Figure I.4.2

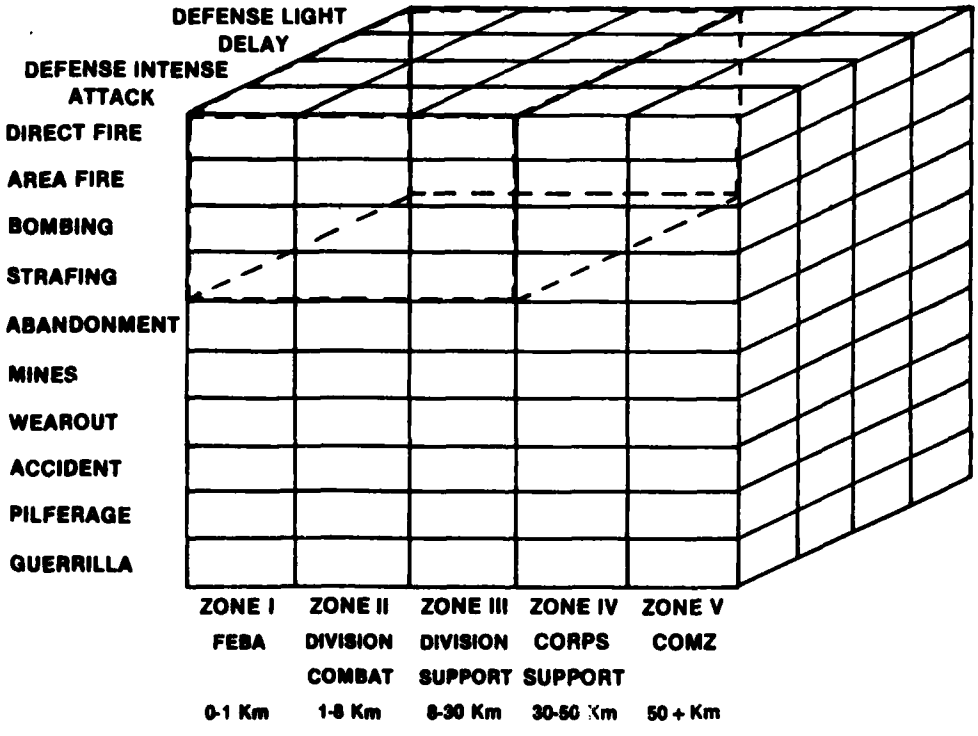


Figure 1.4.3 WARF Matrix

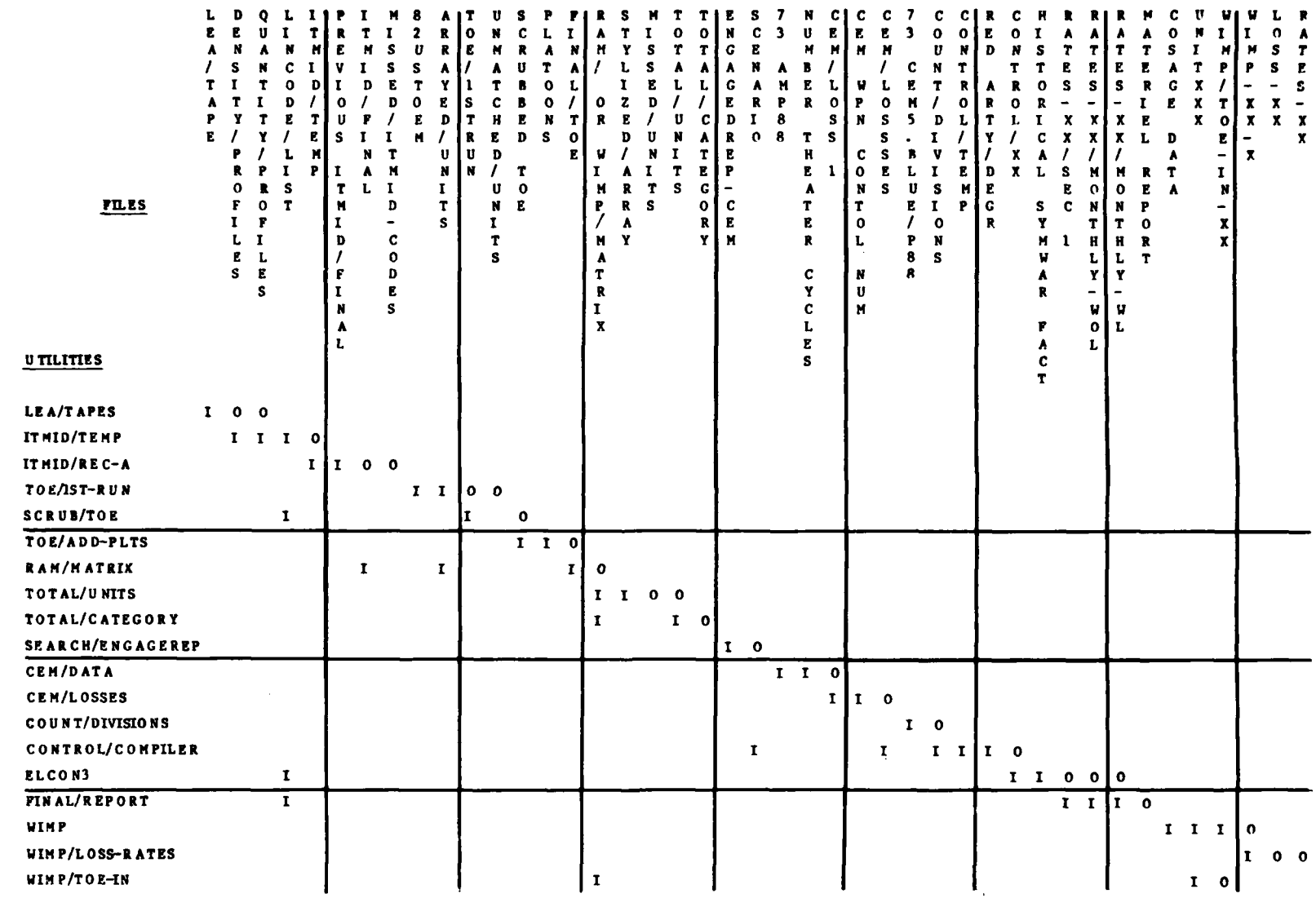

FILES
LEA/TAPE
DENSITY/PROFILES
QUANTITY/PROFILES
LINCODE/LIST
ITMID/TEMP
PREVIOUS ITMID/FINAL
ITMID/FINAL
MISSED/ITMID-CODES
82 USSTOEM
ARRAYED/UNITS
TOE/1ST RUN
UNMATCHED/UNITS
SCRUBBED TOE
PLATOONS
FINAL/TOE
RAM/ OR WIMP/MATRIX
STYLIZED/ARRAY
MISSED/UNITS
TOTAL/UNITS
TOTAL/CATEGORY
ENGAGEDREP-CEM
SCENARIO
73 AMP88
NUMBER THEATER CYCLES
CEM/LOSS1
CEM WPN CONTROL NUM
CEM/LOSSSES
73 CEM5.BLUE/P88
COUNT/DIVISIONS
CONTROL/TEMP
READ ARTY/DEGR
CONTROL/XX
HISTORICAL SYMWAR FACT
RATES-XX/SEC1
RATES-XX/MONTHLY-WOL
RATES-XX/MONTHLY-WL
MATERIEL REPORT
COSAGE DATA
UNITXXX
WIMP/TOE-IN-XX
WIMP-XX-X
LOSS-XX
RATES-XX
UTILITIES
LEA/TAPES
ITMID/TEMP
ITMID/REC-A
TOE/1ST-RUN
SCRUB/TOE
TOE/ADD-PLTS
RAM/MATRIX
TOTAL/UNITS
TOTAL/CATEGORY
SEARCH/ENGAGEREP
CEM/DATA
CEM/LOSSES
COUNT/DIVISIONS
CONTROL/COMPILER
ELCON3
FINAL/REPORT
WIMP
WIMP/LOSS-RATES
WIMP/TOE-IN

Figure I.4.4

SECTION II
SYSTEM SUMMARY

1. GENERAL DESCRIPTION: Before discussing the current methodology, it is of utmost importance to understand the limiting position of WARF. The methodology as described in the previous section assumes that equipment losses can be described via the WARF/SYMWAR matrix. This matrix postulates that equipment is destroyed by 10 causes, is located in 5 zones (describes the entire theater), and that the force owning the equipment is found in 4 postures (attack, defense intense, delay, and defense light). The SYMWAR data base is so organized and demands, when merged with simulations, complete conformity to the matrix. If the assumptions change, then SYMWAR cannot be used as a data base.

   The following definitions apply to describe the current methodology:

   a. DAILY WARF(i) =

$$\frac{\text{Total Kills(i)}}{\text{Average Theater TOE* Authorization(i)} \times \text{\# Days In Period(i)}}$$

   (TOE = Table of Equipment)

   b. Total Kills = Only permanent/ catastrophic/nonrepairable losses.

   c. i = Each of the seven specific time periods (1ST15, 2ND15, 2ND30, 3RD30, 4TH30, 5TH30, 6TH30). For report purposes, 1ST30, 1ST90, and 2ND90 can be added.

   d. WARF RATE = Average daily loss rate expressed as a percent of the average authorized TOE strength in the combat theater per time period.

   The significant changes unique to the WARF P-86 effort are:

   a. A rewrite of the WARF generator model currently known as the Equipment Loss Consolidator (ELCON). In addition to a complete recoding, some new features were added and are explained in Chapter 1 of the ELCON documentation.

   b. The original WARF studies used an input called density profiles to acknowledge the location of equipment by WARF zone. WARF P-85 obtained this input from the Logistics Evaluation Agency (LEA) by zone for each of the seven basic time periods. In order that equipment match CAA's arrayed locations, scheme by TOE was furnished to LEA for WARF P-86 to insure that the division area (zones 1, 2, and 3) was properly described. This entailed an extraction from the arrays supporting the P-86 study of units by TOE/SRC (Standard Requirements Code) and a corresponding WARF zone location. LEA was able to determine units in zones 4 and 5 by exception.

c. The stylized day model, WARF-RAM (Red Artillery Model), is used to generate artillery losses for items not played in the theater model (CEM) nor classified as pure historic items, i.e., all losses derived from SYMWAR. Prior to WARF P-86 equipment was placed into 32 notional target complexes which were fired upon by WARF-RAM. Since units (battalion, company, platoon, etc.) are acquired as targets, not equipment, the notional complexes were dropped in favor of the actual units from the arrays. This allows WARF-RAM to reduce units acquired by the Target Acquisition Model (TAM) with no adjustment.

d. WARF-RAM produces 22 loss rates (one for each equipment vulnerability category)for each combat posture (attack, defense intense, delay, and defense light). Because of its stylized day nature, these loss rates are unchanged for the entire period of conflict. Thus, Red's ability to destroy Blue equipment never varies and does not recognize any degradation of Red artillery nor decreasing availability of Blue targets. To better reflect Red's capability, data was extracted from CEM output (Log Report) so that time-oriented factors could be developed which would be applied to degradate each loss rate.

1.1 DATA REQUIREMENTS: An overall description of the WARF system is in order so that proper linkages are explained. To begin to examine the study flow, a listing of the data requirements will assist in following the transition.

a. Listing of the Major Items of Equipment (MIE) Authorized War Reserve Stocking

(1) Provided by ODCSOPS (DAMO-RQR)

(2) List includes line item (LIN) code--a six position alpha-numeric and the noun nomenclature for each item.

(3) Each MIE is assigned a weapon number or vulnerability category and historical class. This normally includes a CEM weapon or WARFRAM Vulnerability Category (1-22) and historial (SYMWAR) class (1-36) as assigned by CAA.

b. Density and Quanity Profiles for each MIE

(1) Provided by LEA on tape.

(2) Format is theater wide percent by zone and authorized TOE quantity by time period.

(3) LEA is provided the MIE list by ODCSOPS and the unit array scheme for zones 1-3 by CAA.

c. A Logistics Throttle which gives the Capability of the Heavy Materiel Supply (HMS) Companies to Deprocess Heavy Equipment (tanks, ARC, artillery).

(1) Provided by LEA.

(2) Is used to develop the LOG file for CEM for both the AMMO and WARF CEM cases.

(3) Unconstrained equipment resupply is an inherent assumption of WARF; however, this unlimited quantity is throttled by the capability of the HMS companies.

(4) A similar approach is taken for the AMMO CEM using programmed quantities of resupply equipment, but limited to the throttle.

d. Inter- and Intra-Theater (LOC) Shipping Losses

(1) Provided by ODCSOPS (DAMO-RQR).
(2) Includes air, sea, and LOC loss factors.
(3) Specifies percent of MIE shipped by air.
(4) Includes prestock and depot stocks time in days.

e. Red Artillery Systems

(1) Compatible with systems played in CEM.
(2) Includes tubes, MRL, and heavy mortars.

f. *Lethality Data by Red System by Vulnerability Category*

(1) Provided by AMSAA.

(2) Includes data for conventional and ICM shells by type of fuze tube and three environments (open, woods and town for each equipment vulnerability class and personnel).

g. Type Unit Data (target complexes)

(1) Each type unit is extracted from the map arrays supporting the study to compile a TOE/SRC list. This includes all levels of organizations (DIV HHC, BDE, ARC, MECH, INF BN, MECH INF CO, MECH INF PLT, etc.) to include those nondivisional units located in the division area.

(2) Using an automated TOE file developed by CAA (Support Forces Group, FAD), each type unit is queried for equipment listing and quantity, then scrubbed by the MIE list.

(3) Equipment attrition is properly addressed as each type unit reflects actual TOE authorization with correct quantities. Equipment not on the MIE list is removed.

h. Acquired Target List

(1) Same acquired target list generated in support of the AMMO RATES Study.

(2) This list is recoded to reflect the correct type unit identifier and is passed to WARF-RAM.

i. Time Periods

(1) Provided by ODCSOPS (DAMO-RQR).

(2) Normally, the seven basic time periods are specified and drive all other time-oriented inputs such as density and quantity profiles.

(3) For report purposes, up to 10 time periods can be specified.

2. POSTPROCESSOR ORGANIZATION: The study flow includes the preparation of the three prime automated simulations: CEM, WARF/RAM, (or WIMP) and ELCON. Other automated utility routines are used in establishing proper format of data or extracting output from the simulation models. A normal WARF study parallels the ammo rates methodology and assumptions concerning the theater model (CEM) are shared. The only difference between these two efforts, at theater level, is the addition of an unconstrained LOG file in the CEM. All other inputs to CEM used to develop an ammo rates base case are unchanged for the WARF base case. Four outputs of this simulation are used as inputs to ELCON: scenario (percent of the US force in each combat posture for each of the WARF time periods); loss rates for each weapon system (designated as a CEM category per time period); average division strength (number of flags) per time period; and capability of Red artillery for each time period. The first three outputs are extracted using automated utilities and the fourth is manually computed using the CEM Logistic Report.

Preparation of the WARF-RAM begins well before the finalization of a CEM played and the appropriate lethality data for each tube for HE and ICM shells. AMSAA must be provided the tubes (and mortars) by caliber to develop the lethality data for each of the 22 vulnerability categories. Also needed is the ammo rates acquired target list recoded to reflect the type unit information discussed in paragraph 1.c of this Section; there are four units, vulnerability categories, and quantity must be constructed so that WARF-RAM can output loss rates by posture by vulnerability category. The WARFRAM Model is normally operated by the Study team's Artillery Model Analyst. Under WARRAMP, the WARFRAM eventually will be replaced by the WARRAMP WARF Intermiate Material Processor (WIMP). An explanation of the WIMP can be found in Section III, Chapter 2. As of the publication of this document, the WIMP is operational but can not be used in a study due to the arraying of combat and support units found in the Division Area (0-30 KM from the ZEBA). When the compiler testing and arraying is completed, the WIMP will be permanently installed, replacing WARF/RAM.

ELCON is the repository for all data mentioned so far. In addition, the data covered in paragraph 3.1, Chapter 3, is input to ELCON as stated by the documentation.

The last, and largest, input is the equipment file. This includes the LINCODE, nomenclature, vulnerability category (CEM, WARF-RAM (or WIMP) and historical)), depot stockage, percent shipped by air, sequence number, and quantity and density profiles for each MIE. Documentation for this is also covered in the - explanation of ELCON.

2.1 SYSTEM FLOW: The normal flow begins with the creation of the automated equipment file. ODCSOPS provides a hard copy listing of the LIN codes and nomenclatures which are keypunched into a computer file called LINCODE/LIST. When available, the proper equipment loss code (CEM number, vulnerability category, historical class) is added to this file (referred to as Item Record Type A). Item Record Type B and C can be constructed when LEA furnishes the quantity and density profiles tape. The utility LEA/TAPE is used to read this tape and create a raw data file from which a Type B and/or C record can be built. Other utilities are used to complete this requirement.

When the array effort is completed for each posture, the type unit file can be initiated. Each organization that can pose as a target must be represented. The Support Forces Group, Force Development Directoriate, CAA, generates a TOE file, from force accounting data, that is used to complete the type unit file. However, organizations below company level must be developed by utility and manual edited as no data exists in the TOE file for platoons or squads. Again, various utilities are used to organize the type unit file by unit, LIN code of authorized equipment, and quantity. After completion, a scrub is made to delete any equipment that does not match the MIE list. The final type unit file is used to construct the matrix of type units required by WARF-RAM (or WIMP).

When the acquired target lists are available from the AMMO RATES TAM process, target numbers and type unit associations must be completed. If WARF-RAM has the correct Red type artillery and lethality data, then with the addition of the matrix of type units and corrected acquired target lists, computation of the loss rates by vulnerability category by posture can be completed. Under WARRAMP COSAGE replaces such high resolution models as the TAM/RAM formally used in AMMO/WARF Rate Methodology. Thus, the WIMP was developed to operate with COSAGE replacing WARFRAM methodology. The COSAGE provides data to WIMP on Red Artillery fire missions and uses this data to compute blue personnel and equipment losses. The WIMP methodology thus will provide all the current data previously developed by WARFRAM.

Finally, with the conclusion of a CEM WARF base case, the scenario, CEM losses, division flag count, and Red artillery degradation factors can be input to ELCON and initial WARF rates can be produced.

Figures II.2.1 - II.2.9, Section II graphically detail the system flow of the MPP. Each utility found in the MPP is identified along with each file that is used as input and produced as output.

MPP FLOW-1

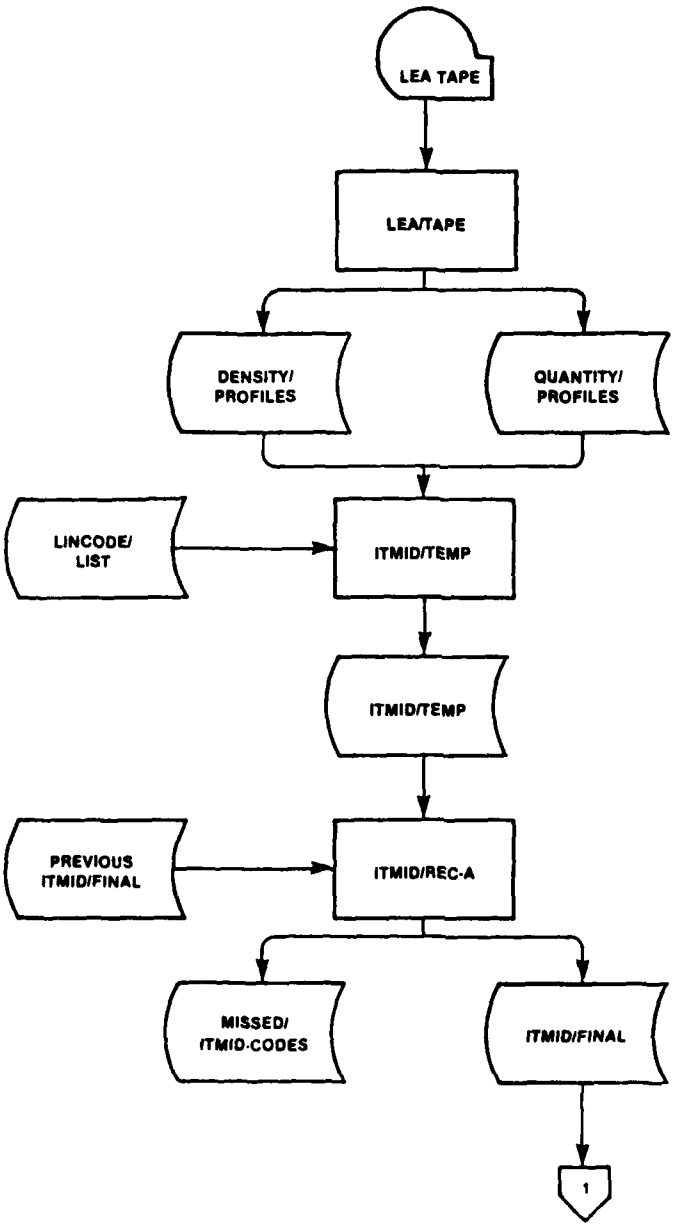


Figure II.2.1

MPP FLOW-2

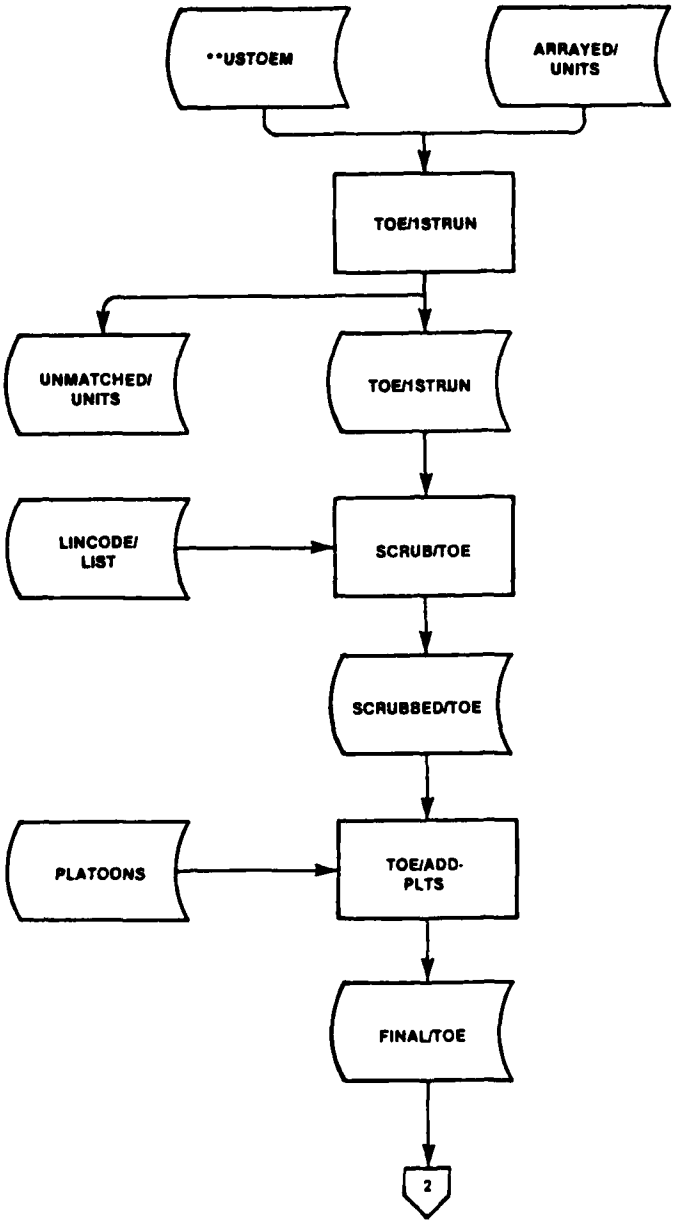
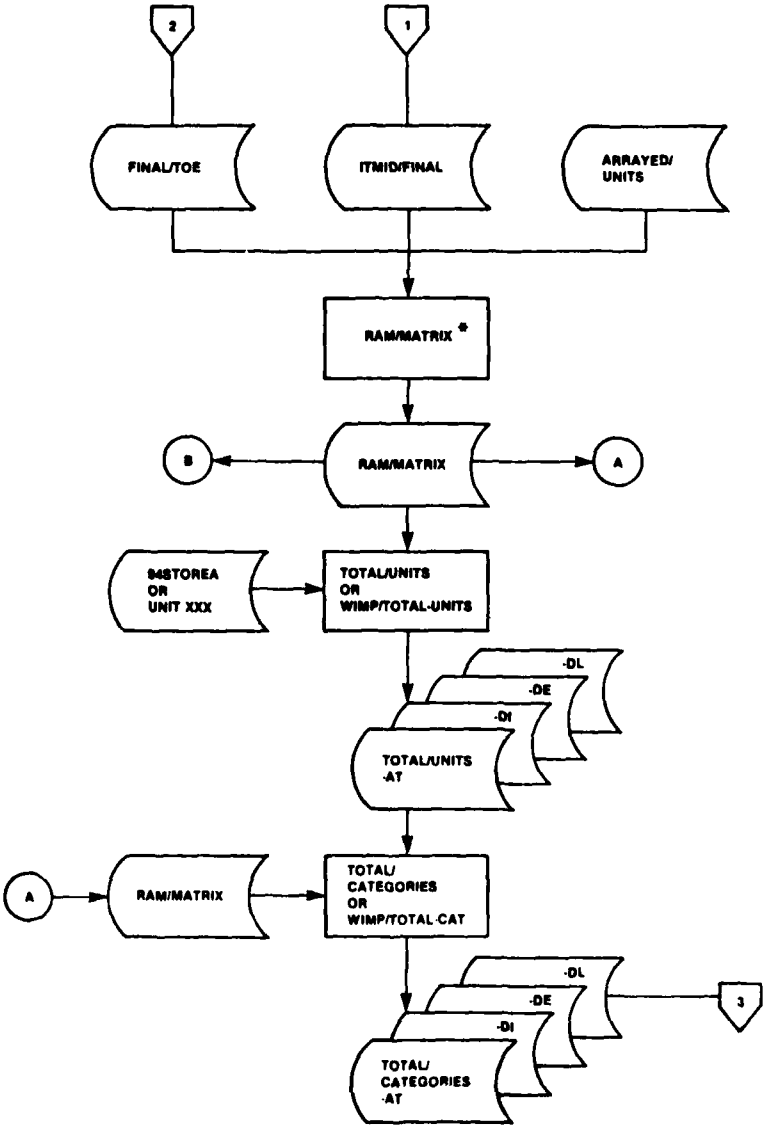


Figure II.2.2

MPP FLOW-3



* The WIMP/MATRIX program may be named in lieu of RAM/MATRIX

Figure II.2.3

MPP FLOW-4

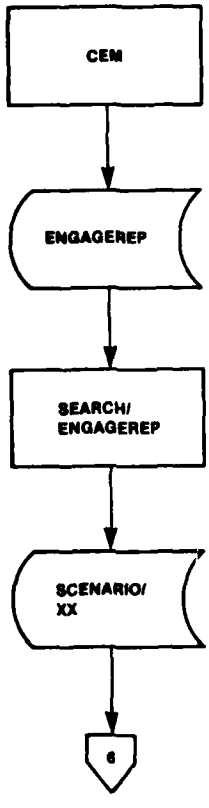


Figure II.2.4

MPP FLOW-5

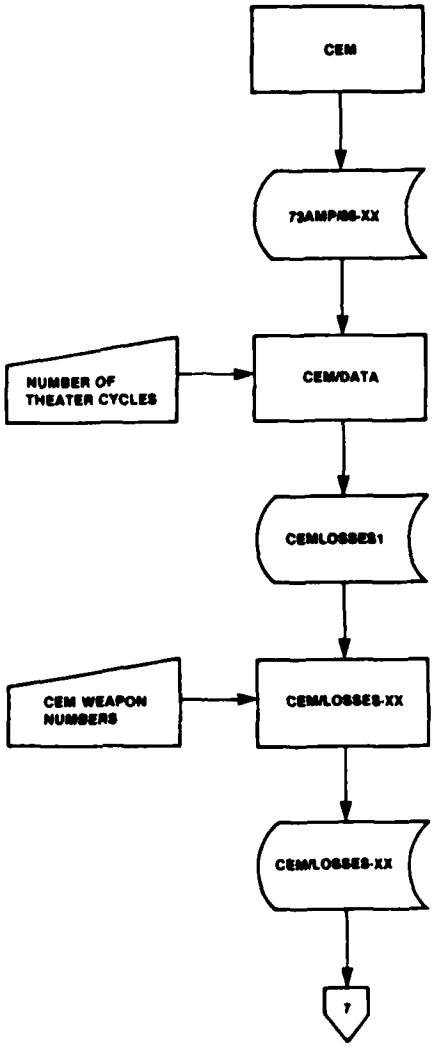


Figure II.2.5

MPP FLOW-6

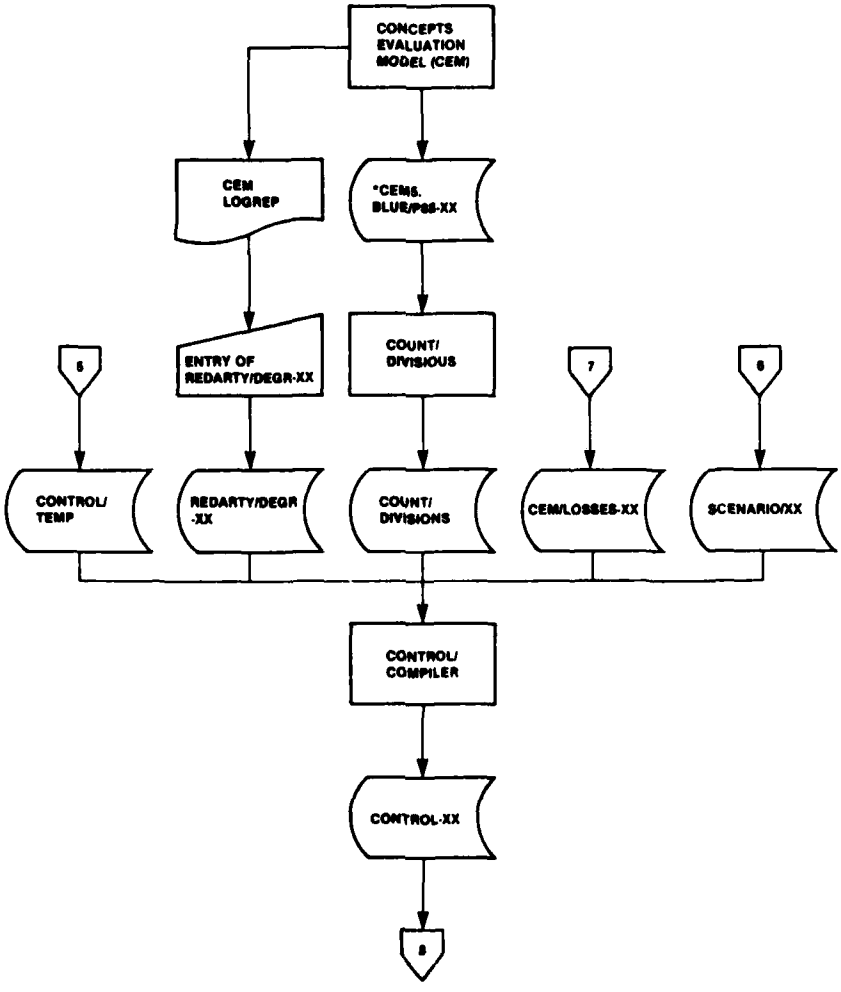


Figure II.2.6

MPP FLOW-7

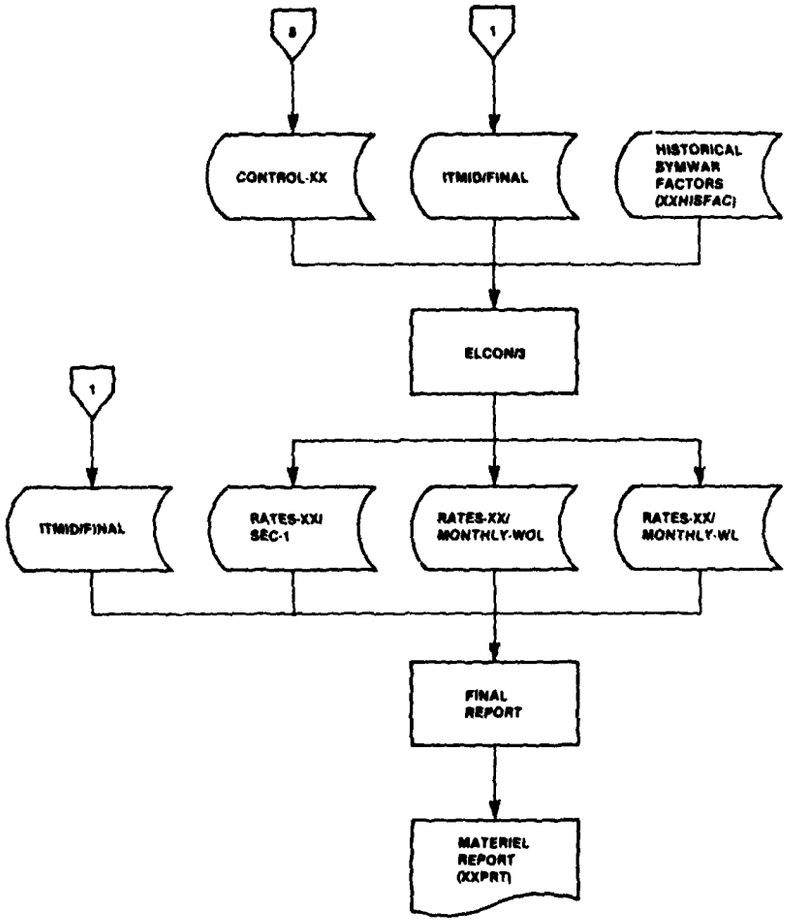


Figure II.2.7

MPP FLOW-8

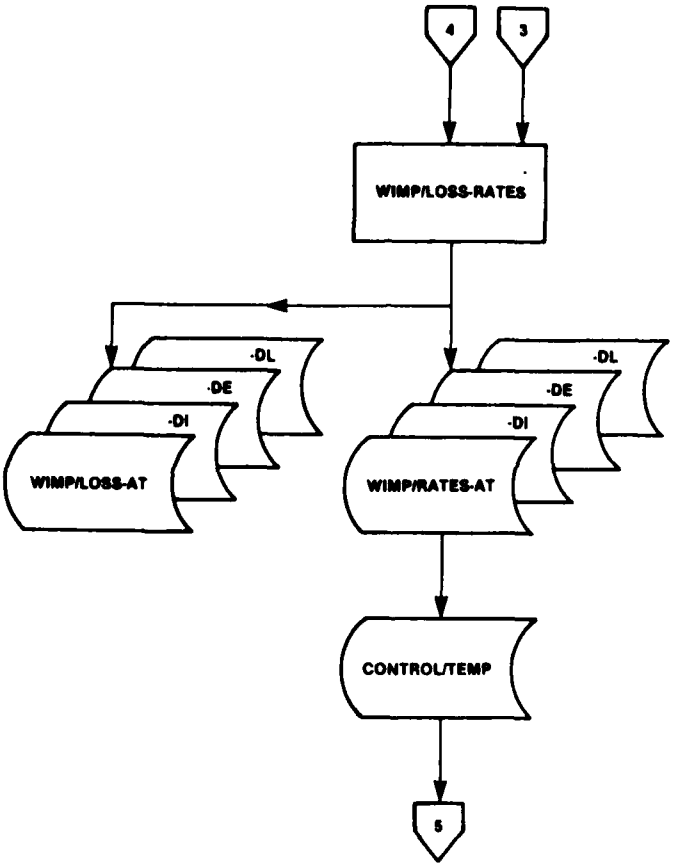
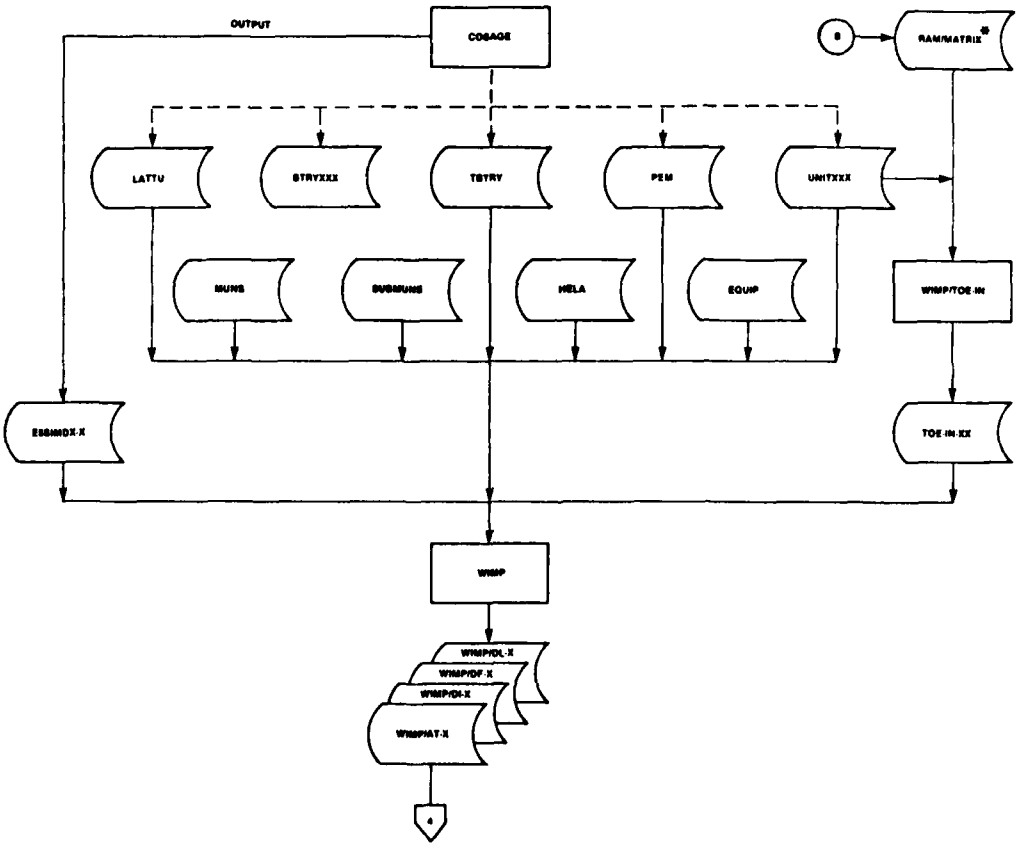


Figure II.2.8

MPP FLOW-9



* The WIMP/MATRIX program may be named in lieu of RAM/MATRIX

Figure II.2.9

SECTION III

Chapter 1
EQUIPMENT LOSS CONSOLIDATOR (ELCON)

1.1 DESCRIPTION - The purpose of the Equipment Loss Consolidator (ELCON) is to combine equipment loss data from historical and computer simulation sources with current equipment deployment and vulnerability information, as calculated in the MPP, in order to compute expected monthly loss rates for a list of specific equipment items. Within a single execution of the program up to 20 sets of loss rates over a combination of time periods can be calculated. A complete discussion of the ELCON process can be found in document CAA-D-79-3, August, 1979, entitled "Equipment Loss Consolidator (ELCON)" which is referenced in Appendix B.

1.2 STRUCTURE - The overall structure of this program is pictured in Figure III.1.1.

1.3 DATA BASE - The data base which supports the ELCON program consists of six files of which three are used as input and three as output. The input files are the CONTROL/XX file, produced by the CONTROL/COMPILER utility, ITMID/FINAL file, produced by the ITMID/REC-A utility, and the HISTORICAL SYMWAR FACTORS file, which is based upon historical data gathered from World War II and Korean War and limited Vietnam experiences. The three output files are the RATES-XX/SEC-1, which summarizes the CONTROL/XX input file using a simular format. The RATES-XX/MONTHLY-WOL which contains the monthly in theater losses (excluding inter-theater shipping, LOC, (intra-theater shipping losses) and depot losses), and the RATES-XX/MONTHLY-WL contains the monthly total loss rates including the inter-theater shipping, LOC (intra-theater shipping losses) and depot losses. Each file will be discussed in more detail in the following INPUT and OUTPUT sections.

1.4 RUNSTREAM - The runstream which is used to control the execution of this program is pictured in Figure III.1.2. The runstream is presently cataloged as an element under the program file CSTART*82XQT using the element name ELCON/3. As the runstream executes it accomplishes the following functions:

- o Assigns to the logical unit 88 the current study's program, in this case SECRET*82WARFP88.
- o In the line 2 the user is required to supply the program file's Read/Write key between the two slashes (88/ / .) in order to gain access to the file.
- o Assigns to the logical unit 4 the file which contains the SYMWAR historical rate factors derived from WWII, Korean War and limited Vietnam experiences. In this current example the file is cataloged as the program file "XXHISFAC".

- o Using the system editor the CONTROL/XX file and the ITMID/FINAL file under the present study's program file are assigned to logical unit 5. The XX portion of the control file must be changed to reflect the appropriate CEM Run Control Number. This number can be obtained from the CEM Operator/Analyst. It will also be used in the creation of the CONTROL file by the CONTROL/COMPILER program.

- o The program itself is cataloged as an element under the program file 82XQT using the elemenet name ELCON/3. The runstream next assigns the program file and element and executes the program.

- o The results of the program collected in logical unit 6 are copied to the permanent file RATES-XX/SEC-1. Those collected in unit 7 are copied to RATES-XX/MONTHLY-WOL, and the contents of unit 8 are copied to RATES-XX/MONTHLY-WL. The "XX" portion of the element name must also be changed to the current CEM Run Control Number. The files are also cataloged under the current study's program file designated by unit 88.

- o All units allocated during the execution of the utility are released. Each type of equipment in the battle area, its density per time period, and the faction of the total amount of equipment to be found in each of the five combat zones per time period. This file is produced by the ITMID/REC-A utility of the MPP. A complete discussion of the file and the three record types which consititute it can be found in Appendix B, document, CAA-D-79-3, ELCON, pages 4-5 and 4-6.

1.5 INPUT - The ELCON uses three files as its input. These files are the Historical SYMWAR Factors file, ITMID/FINAL file and the CONTROL/XX file. Each file is discussed below:

- o Historical SYMWAR Factors file - The equipment loss data found in this file is derived from analysis of WWII, Korean War and limited Vietnam experiences. This file is cataloged under the program file 82HISFAC. within the system. As the data here reflect historical experiences it is static, thus the user is not required to update it. A detailed explanation of the file structure, record layouts and data examples can be found in the USACAA document CAA-D-79-3, ELCON, pages 4-1,4-2, and C-1 through C-4.

- o ITMID/FINAL - This file will contain data which describes each type of equipment in the battle area giving for example, its LINCODE, nomenclature, vulnerability category, etc. Also provided is the quantity of this item authorized and the density or distribution fraction of this item within each of the five zones of the combat area for each of the seven time periods of the study. This file is a product of the ITMID/-REC-A utility. Figure III.1.3 presents a data example of the file.

FILE: ITMID/FINAL
STORAGE MEDIUM: Mass Storage
SOURCE: UTILITY/ITMID/RECA

RECORD FORMAT:

Position	Description	Format
1	Blank	1X
2 - 7	Line item number (LIN)	A6
8	Blank	1X
9 - 38	Alphanumeric nomenclature	5(A6)
39	Blank	1X
40 - 41	Type equipment code for losses from theater model	I2
42 - 43	Vulverability class for losses from artillery model	I2
44 - 45	Classificatin for Historical Data	I2
46 - 48	In-theater dept stockage (number of days supply)	I3
49 - 50	Fraction of intertheater shipment which is by air	F2.2
51 - 52	= 1 if actual equipment density is to be read and used = 0 if density is to be estimated from the number of division in theater	I2
53 - 54	= 1 if combat losses are from the theater simulation = 2 if the combat losses are from artillery models = 3 if all losses are from history	I2
55 - 58	Sequence Number	I4
1 - 49	Quantities of this line item for the seven time periods of the exercise, obtained from the new ITMID/TEMP file.	7(I7)
1 - 35	Density Profiles for Time Period N for this line item in each of the five zones or areas being played in this exercise. These density profiles are obtained from the NEW ITMID/TEMP file. There must be seven occurrences of this record; one for each time period being played.	5(F5.2)

- CONTROL/XX - This file contains such information as run control data, the equipment loss information provided by combat simulation (rather than historical experiences), Red artillery losses, Blue Division strengths, etc. This file is a product of the CONTROL/COMPILER utility. A complete discussion of this file can be found in the CONTROL/COMPILER, Chapter 16 of this document. An example of the data can be seen in Figure III.1.4, Section III.

FILE: CONTROL/XX
STORAGE MEDIUM: Mass Storage
SOURCE: Utility - CONTROL/COMPILER

RECORD FORMAT:

Position	Description	Format
1 - 5	Number of time period on which data is being input.	I5
6 - 10	Maximum sequence number of list of materiel items.	I5
11- 15	Number of types of items on which combat loss data is derived from theater simulation (currently CEM).	I5
16 - 20	Number of sets of loss rates to be computed for each item.	I5
21 - 25	= 0 if historic loss matrix has not been computed for each item and period and stored in previous run; = 1 if previously computed matrices are read on Logical Unit 2.	I5
26 - 30	Number of periods for which replacement equipment is prestocked.	I5
31 - 35	=0 for short printout; = 1 for long printout; = -1 for no printout (File 7 and 8 output only)	I5

Number of Records	Description	Format
1 or 2 (as needed)	No. of days in each time period	1615
1 per set of rates	First and last period considered in i^{th} set of rates	215
1 or 2 (as needed)	Intertheater loss fraction by time period for air shipment	16F5.4
1 or 2 (as needed)	Intertheater loss fraction by time period for sea shipment	16F5.4
1 or 2 (as needed)	In-theater LOC loss fraction by time period	16F5.4
1 or 2 (as needed)	Average number of Blue divisions in theater by period	16F5.2
1 per period	Fraction of time in attack, defense delay, inactive period i	4F5.2
8	For each posture (attack, defense, delay, inactive), 2 records with fraction lost per day of each of 22 vulnerability classes	11F6.3
1 or 2 (as needed)	Fraction of full strength Red artillery effetiveness to be applied by time period	16F5.2
1 or 2 (as needed) per period	Losses from theater model in period i for each type of equipment considered in theater model (expressed as percent lost per 30 days)	16F5.2

1.6 OUTPUT - The ELCON program is capable of producing three output files. These files are the RATES-XX/SEC-1, RATES-XX/MONTHLY-WOL, and RATES-XX/MONTHLY-WL. The XX portion of the file name will be replaced by the appropriate CEM Run Control Number. This number is obtained from the CEM Operator/Analyst. The user will change the file names to reflect this CEM run control number in the runstream using the system editor. Each output file will be discussed below.

- RATES-XX/SEC-1 - This file will be produced only if the PRINT INDICATOR, i.e., Columns 31-35 of the Run Parameters Record in the CONTROL-XX file is set to either "0" or "1". A sample is presented in Figure III.1.5. If it is set to "- 1", this file will not be produced. This file is used to collect output for the ELCON program and format it for printing so that it is understandable by the combat analyst. As noted above, the user will have the option to specify the level of detail that will be contained in the file. If the user enters a "1" in the Print Indicator file of the Run Parameter Record the user will obtain a detailed report as output. This report will contain:

- oo A replay of the CONTROL-XX file that was used as input to the program with the addition of heading information explaining the data which follows it.

- oo A detailed analysis of the loss rates consolidated from the historical data and the results of the theater simulation for each piece of major equipment being played in the study. Included here is the Density Profiles, loss rates from each of the 10 historical causes, losses in depot, etc. A complete example of a typical report can be found in the ELCON documentation, CAA-D-79-3, pages D1 through D-12.

- oo If the user enters a "0" into the Print Indicator field, a shortened version of the report will be prepared. This version will include the formatted replay of the CONTROL-XX file identical to that portion of the detailed output discussed above plus an item by item, one-line summary of each piece of equipment being played. This summary high-lights the equipment line code, name, WARF set (which is defined as a continuous period of time within the model delineated by a start period and an end period) and the loss rates broken out by in-theater losses and inter-theater losses. An example of this output can also be found in the USACAA document CAA-D-79-3, pages D-13 through D-15, Appendix B.

o RATES-XX/MONTHLY-WOL - This file is always produced by the ELCON program. The file details for each item of equipment in the study the monthly in-theater loss rates (excluding inter-theater shipping, LOC (intra-theater shipping losses) and depot losses) for each WARF set or time frame specified by the user. Figure III.1.6 present the record layout and examples of the data found in the file.

FILE: RATES-XX/MONTHLY-WOL

STORAGE: Mass Storage

SOURCE: ELCON

RECORD FORMAT:

Column	Description	Format
1	BLANK	1X
2-7	LINCODE	A6

8	BLANK	1X
9-38	Nomenclature	5(A6)
39-86	Monthly loss rates of this item for each time period in the study. These rates are calculated excluding LOC and Depot losses.	8(F6.2)

- RATES-XX/MONTHLY-WL - This file is similar to the above WOL file except that it contains the total loss rates for LOC, depot and inter-theater shipping losses for each WARF-set identified by the user. This file always is produced by the ELCON utility. Figure III.1.7 depict the record layout and examples of the data contained in the file.

FILE: RATES-XX/MONTHLY-WL
STORAGE: Mass Storage
SOURCE: ELCON

RECORD FORMAT:

Column	Description	Format
1	BLANK	1X
2-7	LINCODE	A6
8	BLANK	X
9-38	Nomenclature	5(A6)
39-86	Monthly loss rates of this item for each time period in the study. These	8(F6.2)

rates are calculated using LOC, Depot and inter-theater shipping losses.

These three output files will be used in conjunction with the ITMID/-FINAL file, produced by the IMID/REC-A utility (Chapter 5) to produce the Final Report which expresses loss rates in daily terms.

1.7 PERFORMANCE - In order to execute successfully the ELCON program requires the following system resources:

CORE:	10K
CPU TIME:	15 MIN OR LESS
CLOCK TIME:	20 MIN OR LESS
DISK UNITS:	1 - 3
COMMENTS:	NONE

ERROR CONDITIONS - The ELCON program has built into it four tests for input errors. Upon detection of an error a short explanatory message which identifies the problem will be written to the RATES-XX/SEC-1 file and in three of the four cases stop execution. Each error condition will be discussed below:

ERROR 1

Message: SEQUENCE # item seq.no. LARGER THAN MAX SPECIFIED

Cause: The sequence number assigned to this equipment item is greater than the maximum specified by the user in the second field of the Run Parameter Record of the CONTROL-XX file.

Solution: Using the system editor access the ITMID/FINAL file and determine the sequence number of the last equipment item of the file. This number is denoted by the last field of the "A" or header record of the equipment item. With this number again using the system editor, access the Run Parameter Record of the CONTROL-XX file and change the maximum sequence number.

ERROR 2

Message: SEQUENCE # item seq. no. MARKED AS CEM ITEM W/O CAT CEM

Cause: The header or "A" record of the item of equipment in the ITMID/-FINAL file indicates that the combat losses for this item will come from CEM but the CEM category used to identify the type of equipment for losses from the theater model (CEM) has not been specified.

Solution: Notify CEM Operator/Analyst of discrepancy. If in fact this item is a CEM item, user must determine the appropriate CEM category and, using the system editor, enter in the appropriate CEM category type code for this item in the third field (i.e., positions 40-41, left justified) of the item's header record of the ITMID/FINAL file.

If it is determined that the item is not a CEM item the user must again access the header record of the item in the ITMID/FINAL file and change the last field (i.e., positions 53-54, left justified) to a 2 (if combat losses ar from artillery) or a 3 (if combat losses are from historical data).

ERROR 3

Message: SEQUENCE # item seq. no. MARKED AS ARTY ITM W/O CATART

Cause: The header or "A" record of the item in the ITMID/FINAL file has indicated in the ninth field (i.e., positions 53-54) that the losses of this item will be from artilery but no artilery vulnerability class has been specified for the item in the fourth field of the record (i.e., positions 42-43).

Solution: Determine whether or not losses for this item are in fact to be determined by artillery. If not using the editor, change the ninth field (i.e., positions 53-54, left justified) to the appropriate loss code 1 = theater simulation (CEM); 3 = historical.

If the loss is to be from artillery, determine the appropriate vulnerability category for the item from the 22 available and using the editor enter it into the fourth field on the header record (i.e., positions 42-43, left justified).

ERROR 4

Message: ITEM # item seq. no. HAS ILLEGAL HISTORICAL CLASS

Cause: For the program to reach this error message the ninth field (positions 53-54) of the header record of the ITMID/FINAL file must be set to 3 (i.e., all losses are from history) and the historical class identifier is not between 1 and 36 and is thus illegal. This error, unlike the other 3, will not cause the program to stop execution.

Solution: Using the Item Sequence Number and the system editor examine the header record for this item, determine the appropriate historical class (i.e., a number from 1 to 36) and enter it into columns 53-54 right justifying the entry.

ELCON STRUCTURE

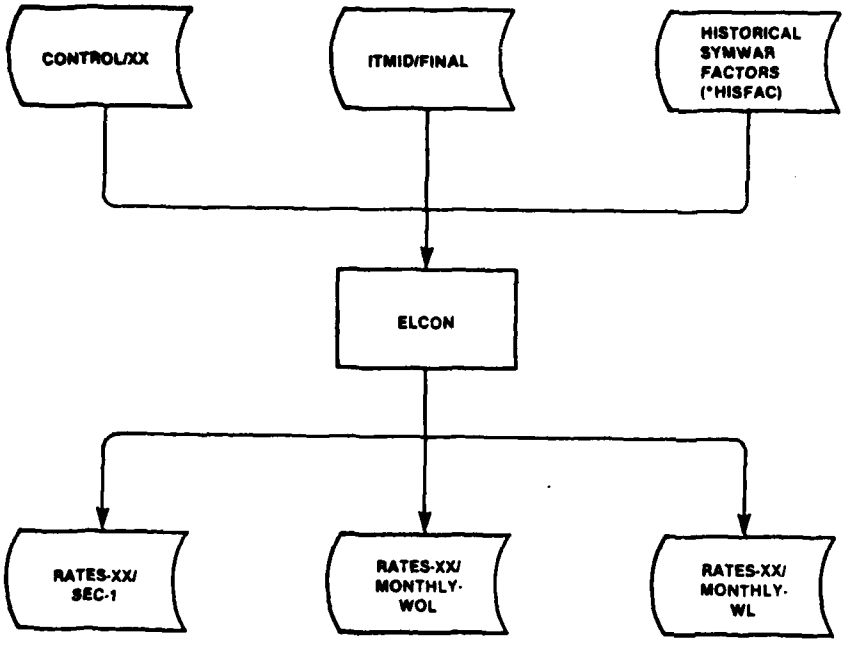


Figure III.1.1

```
UNCLASSIFIED***FILE NAME:CSTART*82XQT  ELEMENT NAME:ELCON/3***UNCLASSIFIED

  1:@USE 88.,SECRET*82ROK87.
  2:@ASG,A 88/    /   .
  3:@ASG,T 6.,///200
  4:@ASG,T 7.,///200
  5:@ASG,T 8.,///200
  6:@ASG,T 2.,///500
  7:@ASG,A 82HISFAC.
  8:@ASG,T 4.,///200
  9:@ED  82HISFAC.,4.
 10:EXIT
 11:@MSG,N  THE ABOVE DATA FILE "82HISFAC" HOLDS THE HISTORICAL
 12:@MSG,N  SYMWAR FACTORS.
 13:@ASG,T 5.,///500
 14:@ED,I 5.
 15:
 16:ADD* 88.CONTROL/XX
 17:ADD* 88.ITMID/FINAL
 18:EXIT
 19:@MSG,N  THE ABOVE ELEMENT FILES "CONTROL/XX" AND "ITMID/FINAL" ARE
 20:@MSG,N  OUTPUT OF "82XQT.CONTROL/COMPILER" AND "82XQT.ITMID/REC-A".
 21:@MSG,N  ALONG WITH THE DATA FILE "82HISFAC" THESE FILES PROVIDE
 22:@MSG,N  ALL THE INPUT DATA NECESSARY FOR THE COMPUTATION OF
 23:@MSG,N  WARF ATTRITION RATES.
 24:@ASG,A 82XQT.
 25:@XQT 82XQT.ELCON/3
 26:@ED  2.,88.HOLD-XX
 27:EXIT
 28:@MSG,N  THE ABOVE ELEMENT "HOLD-XX" IS USED TO STORE
 29:@MSG,N  WARF MARTIX CALCULATIONS AND CAN BE REUSED TO
 30:@MSG,N  COMPUTE LOSS RATES FOR A RERUN OF THE ELCON FOR
 31:@MSG,N  THE SAME RUN.  FOR FURTHER GUIDANCE SEE THE ELCON
 32:@MSG,N  PROGRAMMERS MAINTENANCE MANUAL.
 33:@ED  6.,88.RATES-XX/SEC-1
 34:P 20
 35:EXIT
 36:@ED  7.,88.RATES-XX/MONTHLY-WCL
 37:P 20
 38:EXIT
 39:@ED  8.,88.RATES-XX/MONTHLY-WL
 40:P 20
 41:EXIT
 42:@MSG,N  THE ABOVE ELEMENT FILES CONTAIN THE OUTPUT DATA FROM THIS
 43:@MSG,N  UTILITY.  ALL RATES ARE EXPRESSED IN MONTHLY TERMS.  THIS
 44:@MSG,N  DATA WILL BE USE AS INPUT BY THE UTILITY "82XQT.FINAL/REPORT"
 45:@MSG,N  , WHICH WILL CONVERT THE MONTHLY RATES TO DAILY.  THE "XX"
 46:@MSG,N  IN THE ELEMENT NAMES MUST CORESPOND TO THE APPROPRIATE
 47:@MSG,N  CEM RUN CONTROL NUMBER.
 48:@FREE 2.
 49:@FREE 4.
 50:@FREE 5.
 51:@FREE 6.
 52:@FREE 7.
 53:@FREE 8.
 54:@FREE 88.
```

Figure III.1.2

```
UNCLASSIFIED***EXAMPLE OF THE OUTPUT OF UTILITY ITMID/REC-A***UNCLASSIFIED

  1: A03198 AK VEH M218 GM EQ P1A            0 522 30 0 1 2   1
  2:      54      64      44      58      78      88      88
  3:  .00   .00   .00   .80   .20
  4:  .00   .00   .00   .80   .20
  5:  .00   .00   .00   .80   .20
  6:  .00   .00   .00   .80   .20
  7:  .00   .00   .00   .80   .20
  8:  .00   .00   .00   .80   .20
  9:  .00   .00   .00   .75   .25
 10: A14752 ADAP TEST CAMERA LM178           01636 30 0 1 2   2
 11:      10      16      16      17      17      17      17
 12:  .00   .00   .20   .80   .00
 13:  .00   .00   .20   .80   .00
 14:  .00   .00   .20   .80   .00
 15:  .00   .00   .15   .85   .00
 16:  .00   .00   .15   .85   .00
 17:  .00   .00   .35   .65   .00
 18:  .00   .00   .35   .65   .00
 19: A22496 AIMING CIRCLE M2 W/E             01636 30 0 1 2   3
 20:   6615   6699   8820   8823   8823   8823   8978
 21:  .25   .25   .50   .00   .00
 22:  .25   .25   .50   .00   .00
 23:  .25   .25   .50   .00   .00
 24:  .25   .25   .50   .00   .00
 25:  .25   .25   .50   .00   .00
 26:  .25   .25   .50   .00   .00
 27:  .25   .25   .50   .00   .00
 28: A23770 AIR COND FL/WNDW 60008           01833 30 0 1 2   4
 29:      0       0       0       0       0       0       0
 30:  .00   .00   .00   .00   .00
 31:  .00   .00   .00   .00   .00
 32:  .00   .00   .00   .00   .00
 33:  .00   .00   .00   .00   .00
 34:  .00   .00   .00   .00   .00
 35:  .00   .00   .00   .00   .00
 36:  .00   .00   .00   .00   .00
 37: A23828 AIR COND F/WA 9000 BTU           01833 30 0 1 2   5
 38:    889     993     998     998     998     998     998
 39:  .00   .00   .25   .25   .50
 40:  .00   .00   .25   .25   .50
 41:  .00   .00   .25   .25   .50
 42:  .00   .00   .25   .25   .50
 43:  .00   .00   .25   .25   .50
 44:  .00   .00   .25   .25   .50
 45:  .00   .00   .25   .25   .50
 46: A24044 AIR COND 18000 BTU               01833 30 0 1 2   6
 47:     53      53      53      55      55      55      55
 48:  .00   .00   .00   .50   .50
 49:  .00   .00   .00   .50   .50
 50:  .00   .00   .00   .50   .50
 51:  .00   .00   .00   .50   .50
 52:  .00   .00   .00   .30   .70
 53:  .00   .00   .00   .30   .70
 54:  .00   .00   .00   .30   .70
 55: A24318 AIR COND 18000 BTU               01833 30 0 1 2   7
 56:      15      25      42      57      63      83      97
 57:  .00   .00   .25   .75   .00
```

Figure III.1.3

```
UNCLASSIFIED***EXAMPLE OF THE OUTPUT DATA FROM UTILITY CONTROL/COMPILER***UNCLAS

   1:TEMPORARY CONTROL DATA FILE WARF P88(12DEC
   2:     7     6     9    10     0     2    -1
   3:    15    15    30    30    30    30    30
   4:     1     1
   5:     2     2
   6:     1     2
   7:     3     3
   8:     4     4
   9:     5     5
  10:     6     6
  11:     7     7
  12:     1     4
  13:     5     7
  14:  .05   .05   .05   .01   .01   .00   .00
  15:  .15   .15   .23   .10   .05   .02   .00
  16:  .15   .15   .10   .10   .05   .05   .05
  17: 48.1 51.5 52.0 52.0 52.0 52.0 52.0
  18: .000 .141 .059 .800
  19: .255 .145 .050 .600
  20: .200 .155 .005 .640
  21: .100 .055 .105 .840
  22: .005 .055 .140 .800
  23: .305 .005 .000 .690
  24: .555 .000 .000 .445
  25:  .000  .994  .211 1.666  .222  .111  .666  .090  .138  .899  .574
  26:  .224  .691  .264  .714  .999  .744  .359  .807  .644  .921  .100
  27:  .100  .992  .600 2.744  .578  .000  .299  .000  .704  .000 2.192
  28: 7.682 3.339  .668 1.750 1.199  .502  .079  .515  .597  .000  .080
  29:  .200 2.507 1.254  .927  .494  .000  .633  .000  .283  .284 1.609
  30: 6.753 3.355  .895 3.001 1.679 1.789  .465  .899  .566  .000  .090
  31:  .050  .255  .064  .555  .888  .010  .088  .550  .923  .760  .064
  32: 3.142 7.460  .533  .850  .973  .349  .077  .050  .778  .000  .080
  33:  .649 .764 .9801.000 .950 .485 .196
  34:  64.00  1.40   .00   .00 10.00 24.00 36.00 72.00  7.90   .00  8.00   .00   .00
  35:  56.00  1.40   .00  2.00 20.00 34.00 52.00 60.00  4.20   .00  9.00   .00   .00
  36:  50.00   .90   .00  2.00 15.00 24.00 37.00 28.00  2.30   .00  7.00   .00   .00
  37:  27.00   .50   .00   .00  6.00 18.00 25.00 10.00   .60   .00   .00   .00   .00
  38:  19.00   .40   .00   .00  5.00 13.00 16.00  4.00   .50   .00  6.00   .00   .00
  39:  30.00   .30   .00  4.00  4.00 14.00 33.00  3.00   .10   .00  4.00   .00   .00
  40:  17.00   .10   .00  2.00  3.00  7.00 15.00  1.00   .10   .00  1.00   .00   .00
```

Figure III.1.4

```
UNCLASSIFIED***EXAMPLE OF RATES-XX/SEC-1 OUTPUT DATA FROM UTILITY ELCON/3

TEMPORARY CONTROL DATA FILE WARF P88112DEC



NPER   MXITM   # CEM CLASSES   #WARF SETS
  7       6          9              10


DAYS PER PERIOD
  15   15   30   30   30   10   30

FIRST AND LAST PERIOD FOR EACH WARF SET
   1    1
   2    2
   1    2
   3    3
   4    4
   5    5
   6    6
   7    7
   1    4
   5    7


AIR LOSS RATE BY PERIOD
  .050   .050   .050   .010   .010   .000   .000

SEA LOSS RATE BY PERIOD
  .150   .150   .230   .100   .050   .020   .000

LOC LOSS RATE BY PERIOD
  .150   .150   .100   .100   .050   .050   .050

AVERAGE LARGE UNITS BY PERIOD
 48.10  51.50  52.00  52.00  52.00  52.00  52.00

FRACTION OF FORCE BY POSTURE BY PERIOD
ATTACK   DEFEND   WITHDRAW   INACTIVE
 .0000   .1410     .0590      .8000
 .2550   .1450     .0500      .6000
 .2000   .1550     .0050      .6400
 .1000   .0550     .1050      .8400
 .0050   .0550     .1400      .8000
 .3050   .0050     .0000      .6900
 .5550   .0000     .0000      .4450

ARTY KILLS (% PER DAY) BY VULN CLASS BY POSTURE

   .000    .994    .211   1.666    .222    .111    .666    .090    .138    .899    .574
   .224    .691    .264    .714    .999    .744    .359    .907    .644    .921    .100

   .100    .992    .600   2.784    .578    .000    .299    .000    .704    .000   2.192
  7.682   3.339    .668   1.750   1.199    .502    .078    .515    .597    .000    .080

   .200   2.507   1.254    .927    .494    .000    .633    .000    .283    .284   1.609
  6.753   3.355    .895   3.001   1.678   1.789    .465    .898    .566    .000    .090

   .050    .255    .064    .555    .888    .010    .088    .550    .823    .760    .064
  3.142   7.460    .533    .850    .973    .349    .077    .050    .778    .000    .080


ARTY SCALNG FACTORS BY PERIOD
  .649   .764   .980  1.000   .950   .485   .196

CEM KILLS (% PER 30 DAYS) BY CLASS BY PERIOD

 64.000  1.400   .000   .000 10.000 24.000 36.000 72.000  7.800

 56.000  1.400   .000  2.000 20.000 34.000 52.000 60.000  4.200

 50.000   .900   .000  2.000 15.000 24.000 37.000 28.000  2.300

 27.000   .500   .000   .000  6.000 18.000 25.000 10.000   .600

 19.000   .400   .000   .000  5.000 13.000 16.000  4.000   .500

 30.000   .300   .000  4.000  4.000 14.000 33.000  3.000   .100

 17.000   .100   .000  2.000  3.000  7.000 15.000  1.000   .100
```

Figure III.1.5

UNCLASSIFIED***EXAMPLE OF RATES-XX/MONTHLY-WOL OUTPUT DATA FROM UTILITY FLCON/3

1:	A03198	AK VEH M218 GM FG P1A	2.43	3.21	2.85	2.48	3.14	3.11	2.28	3.03	2.85	2.80
2:												
3:	A14752	ADAP TEST CAMERA LM178	8.04	10.65	9.64	9.79	10.48	10.26	8.08	7.06	10.20	8.47
4:												
5:	A22496	AIMING CIRCLE M2 W/E	30.73	40.37	35.58	39.79	49.34	46.76	21.56	18.44	42.10	28.86
6:												
7:	A23770	AIR COND FL/WNDW 6000B	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
8:												
9:	A23828	AIR COND F/WA 9000 BTU	1.15	1.77	1.49	1.44	2.14	2.10	.95	.87	1.69	1.31
10:												
11:	A24044	AIR COND 18000 BTU	.60	.74	.67	.47	.83	.74	.33	.47	.66	.51
12:												

Figure III.1.6

UNCLASSIFIED•••EXAMPLE OF THE RATES-XX/MONTHLY-WL OUTPUT DATA FROM ELCON/3

1:	AD3198	AK VEH M218 GM EQ P1A	2.89	8.52	5.94	3.27	11.82	6.57	3.15	3.31	7.18	4.21
2:												
3:	A14752	ADAP TEST CAMERA LM178	9.70	24.23	18.63	13.13	17.44	12.51	9.14	7.84	16.54	9.77
4:												
5:	A22496	AIMING CIRCLE M2 W/E	37.08	49.58	43.34	57.60	73.84	56.98	24.38	20.51	59.07	33.08
6:												
7:	A23770	AIR COND FL/WNDW 6000B	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
8:												
9:	A23828	AIR COND F/WA 9000 BTU	1.36	5.25	3.41	1.98	3.13	2.49	1.06	.94	2.89	1.47
10:												
11:	A24044	AIR COND 18000 BTU	.71	.87	.79	.62	2.31	.88	.37	.50	1.21	.58
12:												

Figure III.1.7

CHAPTER 2

WARF INTERMEDIATE MATERIEL PROCESSOR

2.1 DESCRIPTION - The purpose of this utility is to calculate catastrophic (non-repairable) losses to major items of equipment and personnel (not evaluated in the Concepts Evaluation Model) resulting from Red Artillery firing on Blue Units in the Combat Sample Generator (COSAGE). This utility replaces the WARF RAM methodology for computing indirect fire losses used in previous AMMO/WARF Studies (P-85, P-86 and P-87). This utility is the only one in the MPP which is written in SIMSCRIPT II.5.

The use of WARF RAM in place of the WARF Intermediate Materiel Processor (WIMP) is noted throughout the text of this manual due to the fact that as of publication date, the Combat Support Units (i.e., AG Company, TMT Company, Combat Engineer Company, etc.) will not be arrayed in the COSAGE stylized units arrays. A modification of the COSAGE Compiler, which will permit the use of more computer core, thus allowing the arraying of these units is completed. With this modification the WIMP will be permanently installed and used in place of WARF RAM in the WARRAMP WARF methodology.

Additionally, modifications to COSAGE such as the addition of TACAIR modules and capability will result in further modifications in this utility to handle the calculation of losses of blue MIE and personnel resulting from Red TACAIR.

The utility consists of nine routines in addition to its preamble. Nine of these routines bring data from input files into the program and prepare it for processing by the WARF ARTY routine. The WARF ARTY routine calculates the actual catastrophic losses to personnel and the 22 equipment vulnerability categories for each blue unit fired upon by Red Artillery. The output of this utility is used by the utility WIMP/LOSS-RATES to compute the loss rate for personnel and the 22 equipment vulnerability categories by posture. The output of WIMP/LOSS-RATES is then manually placed in lines 25-32 of the CONTROL/TEMP input data file used by the utility CONTROL/COMPILER.

2.2 STRUCTURE - Figure III.2.1 demonstrates the overall structure of this utility. From the diagram it can be seen that five input files are produced specifically for the WARF Intermediate Processor.

2.3 DATA BASE - The data base which supports this utility consists of eleven basic files. Six of the files are obtained from the COSAGE Data Base. These six files (BTRY)XXX, CATTU, TBTRY, PEM, UNITXXX AND MUNS) are input files used by COSAGE. The files are copied by the WARF analyst (on a terminal via the System Editor from the COSAGE files and used in their original format. The next three files EQUIP, HELA, and SUBMUNS are

in the same format as the COSAGE input files EQUIP, HELA, and SUBMUNS, but must be modified by the WARF Analyst to reflect personnel and 22 equipment classes; HE catastrophic lethal areas; and DP catastrophic lethal areas. For specific instructions on the data and construction of the files mentioned so far see the appropriate sections of COSAGE Data Requirement Document, CAA-D-80-8, Ist Edition, dated 1 June 80.

The next input file, TOE-IN-XX, is created by the utility WIMP/TOE-IN* for each posture using the input files UNITXXX and RAM/MATRIX. The final file E5SIMU4X-X is produced during each run of COSAGE for WIMP. It contains data on each Red fire mission for a posture.

2.4 RUNSTREAM - Figure III.2.2 depicts the runstream which is used to control the execution of this utility. As the runstream executes, it accomplishes the following functions:

- o Establishes a Breakpoint and assigns it a name XXPRINT. This action will open logical unit number 6, the system default print output unit designator, causing output to be directed to unit 6.
- o Assigns various program files (i.e. 82 WIMP., 82 WIMPDATA.)
- o Assigns the output file also the logical unit called SIMU3.
- o Assigns the input file E5SIMUX-X, to the logical unit called SIMU4. (The current name of this file, must be obtained from the CEM Operator/Analyst.)
- o The program, which is located in the element 82WIMP, ABs, is executed.
- o The 10 elements or data files used as input to this program and are found under the program file 82WIMPDATA are added sequentially to the input file.
- o Indicates that internal to the program references to 88 will mean the program file 82STUDY.
- o The contents of the output file 82WIMPOUT are copied to the file 88.WIMP/XX-X. As noted in the runstream the "XX" portion of this file name must be changed by the user to reflect the proper combat posture (i.e., AT, DE, DI or DL) of the study. This posture code must correspond to the posture codes of the four posture dependent input files, UNITXXX, BTRYXXX, and TOE-IN-XX. Further, the final portion of the file name must be replaced with the run sequence number.

* Currently this program does not provide authorized personnel quantities. Rates are not being computed for personnel losses by WIMP at this time, although the capability has been developed in WIMP to do so in the future.

- o Unit 88 is released.
- o The Breakpoint is closed.
- o Using the system editor the print file XXPRINT is read into the system for editing.

2.5 INPUT - The input to the WARF Intermediate Materiel Processor (WIMP) consists of eleven basic files. Six of these files (CATTU, UNITXXX, DEM, TBTRY, BTRYXXX and MUNS) are copies of the COSAGE input files of the same name. Three of these files (EQUIP, SUBMUNS and HELA) are similar in format and content to the COSAGE input files of the same name, but must be unconstructed by the WARF analyst to reflect 22 Equipment and 1 personnel vulnerability category; catastrophic lethal areas for each equipment and personnel category to each DP submunition and HE munition. The tenth file TOE-IN-XX is created for each combat posture by the utility WIMP/TOE-IN and contains the TOE personnel and equipment quantity in each blue unit in the array by vulnerability category. The eleventh file is created exclusively for WIMP and provides data on each Red Artillery fire mission executed in the COSAGE Simulation for a posture. Each of the eleven files will be briefly discussed below. For a more detailed explanation of the first nine files, see the COSAGE Data Requirements Document, 1st Edition CAA-D-80-8, dated 1 June 80.

- o CATTU - This file contains descriptive data on each type of combat unit modeled on the battlefield. The file provides such data as:

  -Type of Unit

  -Category of Unit

  -Distance from FEBA of Unit

  -Unit rate of movement

  -Unit Value (Military Worth)

  -Unit radices

  -Principal type of equipment

  This file is copied from the COSAGE INPUT Data file of the same name.

  This file is read into the system by the CAT.TU.INPUT routine.

- o EQUIP - This file contains data which identifies each type of equipment by vulnerability category and personnel. This file is created by the WARF analyst using COSAGE format for same file.

  This file is also read into the system by the EQ.TE.INPUT routine.

- UNITXXX - This file is one of the three files whose contents will change depending on the combat posture (i.e., Attack, Detense intense, Delay, and Defense light). Data in this file describes each unit in the battle area for a particular posture:

  - Number of Units
  - Unit ID
  - Unit X, Y coordinates within battlefield.
  - Unit's parent Unit
  - Unit's color (i.e., Red or Blue)
  - Weapons assigned
  - Weapon status
  - Weapon quantity

  This file is copied from the COSAGE input file of the same name.

  This file is read into the system by the UNIT.INPUT routine.

- PEM - This file provides information to the program on the current posture, environment and mission of units in the battle. Contained in this file is the appropriate names for the posture, environment and mission. This file is copied from the COSAGE input file of the same name. This file is read into the system by the PEM$INPUT routine.

- TBTRY - This file provides data to the model which describes the type of battery which is firing upon the Units. This file is read into the system by the TB$INPUT routine. This file is copied from the COSAGE input file of the same name.

- BTRYXXX - This file is one of the three files used by the model whose data will change depending on the particular combat posture being modelled. This file is read into the system by the BTRY$INPUT routine. This file is copied from the COSAGE input file of the same name.

- MUNS - This file will provide data to the model identifying and describing the various types of munitions and submunitions that will be used in the battle. This file is read by the MUNS$INPUT routine. This file is copied from the COSAGE input file of the same name.

- SUBMUNS - This file contains data which describes the lethal area of DP explosive submunitions against WARF personnel and equipment vulnerability categories. This data will be used by the model to determine catastrophic losses of blue personnel and equipment. This file is prepared by the WARF analyst using the same guidelines as documented for the COSAGE input file of the same name. The file is read by the SUBM$ INPUT routine.

- HELA - This file contains data which describes the lethal area of HE munitions against WARF personnel and equipment valuability categories. This data wil be used by the model to determine catastrophic losses of blue personnel and equipment. The file is prepared by the WARF analyst using the same guidelines as documented for the COSAGE input file of the same name. The file is read by the HELAINPUT routine.

- TOE-IN-XX - The contents of this file will change depending on the particular combat posture being studied. The file will contain data on the TOE quantity of personnel and equipment by vulnerability category authorized each blue unit arrayed. The file is created by the utility WIMP/TOE-IN which is explained in detail in Chapter 4.

- E5SIMUX-X - The contents of this file will change with each posture and run of the COSAGE. The file contains a variety of the data on each Red Artillery file mission executed within COSAGE. The file is created exclusively for the WIMP and its exact title explanation must be acquired from the COSAGE analyst/operator.

2.6 OUTPUT - The OUTPUT data file from this utility 82WIMPOUT is placed in the General Study file under the element name WIMP/XX-X. This file will contain the remaining personnel and equipment to be found in each blue unit which was not attritted by Red Artillery fire. This file will be used as input by the utility WIMP/LOSS-RATES, which will compute the loss rates for each personnel and equipment vulnerability category for the entire blue force arrayed.

2.7 PERFORMANCE - In order to execute the model requires the following resources:

o CORE:	150K
o CPU TIME:	5 - 10 MIN
o CLOCK TIME:	10 - 15 MIN
o DISK UNITS:	1 - 2
o COMMENTS:	CPU AND CLOCK TIME VARIES BY POSTURE

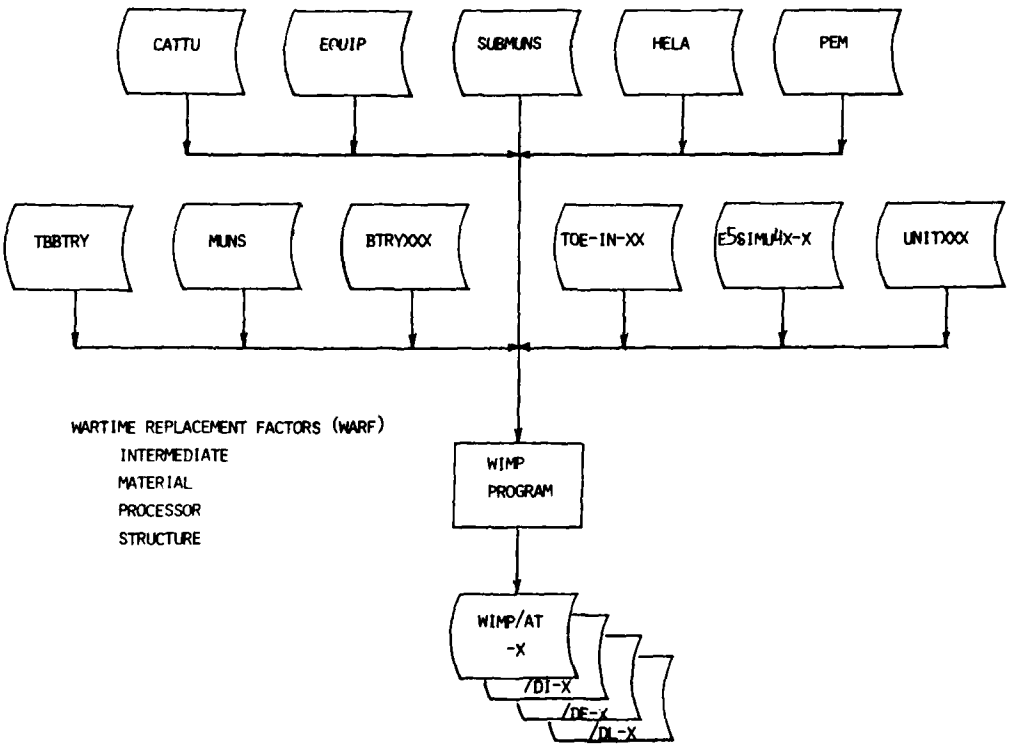


Figure III.2.1

```
UNCLASSIFIED***FILE NAME:CSTART*82XQT  ELEMENT NAME:*IMP***UNCLASSIFIED

  1:@PAUSE PRINTS/82PRINT
  2:@ASG,A 82*IMP.
  3:@ASG,A 82*IMPDATA.
  4:@ASG,A 82*IMPOUT.
  5:@FMS 82*IMPOUT.
  6:@ASG,A ESSIMUX-X.
  7:@MSG,N  THE ABOVE FILE CONTAINS THE COSAGE OUTPUT DATA
  8:@MSG,N  PREPARED SPECIFICALLY FOR THE *IMP.  THE FILE NAME
  9:@MSG,N  WILL NORMALLY CHANGE FOR EACH RUN OF COSAGE.  CHECK
 10:@MSG,N  WITH THE COSAGE ANALYST/OPERATOR FOR THE CORRECT
 11:@MSG,N  FILE NAME FOR EACH RUN.
 12:@USE SIMU3,82*IMPOUT.
 13:@USE SIMU4,ESSIMUX-X.
 14:@XQT 82*IMP.APS
 15:@ADD,LP 82*IMPDATA.CATTU
 16:@ADD,LP 82*IMPDATA.EQUIP
 17:@ADD,LP 82*IMPDATA.UNITDEF
 18:@ADD,LP 82*IMPDATA.PEM
 19:@ADD,LP 82*IMPDATA.TBIFY
 20:@ADD,LP 82*IMPDATA.PTRYDEF
 21:@ADD,LP 82*IMPDATA.MUNS
 22:@ADD,LP 82*IMPDATA.SUBMUNS
 23:@ADD,LP 82*IMPDATA.HELA
 24:@ADD,LP 82*IMPDATA.TOE-IN-XX
 25:@MSG,N  ALL THE ABOVE ADD FILES, EXCEPT "BRTYXXX", "TOE-IN-XX",
 26:@MSG,N  AND "UNITXXX" REMAIN CONSTANT FOR EACH RUN OF THE *IMP
 27:@MSG,N  FOR A STUDY.  THE OTHER THREE FILES *ILL CHANGE FOR
 28:@MSG,N  EACH POSTURE.
 29:@USE 88.,82TCOSAGE.
 30:@ASG,A 88.
 31:@FD 82*IMPOUT.,88.*IMP/XX-X
 32:F 2C
 33:LAST
 34:EXIT
 35:@MSG,N  THE ABOVE ELEMENT "*IMP/XX-X" CONTAINS THE
 36:@MSG,N  OUTPUT DATA PRODUCED BY THE *IMP.  THE
 37:@MSG,N  "XX-X" PORTION OF THE ELEMENT NAME MUST BE
 38:@MSG,N  CHANGED TO REFLECT THE APPROPRIATE POSTURE (IE.
 39:@MSG,N  AT, OI, DE OR DL) AND SEQUENCE NUMBER OF THE
 40:@MSG,N  RUN (IE. 1 - 10).
 41:@FREE 8F.
 42:@PAUSE PRINTS
 43:@FD,R 82PRINT.
```

Figure III.2.2

UNCLASSIFIED***EXAMPLE OF WIMP OUTPUT DATA***UNCLASSIFIED

1:	0.	0.	0.	0.	1.	0.	0.	0.	0.	0.	0.	0.
2:	0.	0.	107.	19.	84.	68.	4.	26.	0.	0.	0.	
3:												
4:	0.	0.	1.	0.	1.	0.	0.	1.	0.	0.	0.	0.
5:	0.	0.	68.	11.	30.	28.	0.	2.	0.	0.	0.	
6:												
7:	0.	0.	0.	0.	0.71	0.	0.	0.	0.	0.	0.	0.
8:	0.	0.	101.31	17.39	75.98	50.56	2.29	25.67	0.	0.	0.	
9:												
10:	0.	0.	0.	0.	0.25	0.41	0.	2.81	0.	0.	0.77	0.
11:	0.	0.	98.32	0.54	19.73	19.24	1.00	8.24	0.	0.	0.	
12:												
13:	0.	0.	0.99	0.	0.93	0.	0.	0.99	0.	0.	0.	0.
14:	0.	0.	67.26	10.72	29.13	27.19	0.	1.99	0.	0.	0.	
15:												
16:	0.	0.	0.	0.	1.	0.	0.	0.	0.	0.	0.	0.
17:	0.	0.	107.	19.	84.	68.	4.	26.	0.	0.	0.	
18:												
19:	0.	0.	1.	0.	1.	0.	0.	1.	0.	0.	0.	0.
20:	0.	0.	68.	11.	30.	28.	0.	2.	0.	0.	0.	
21:												
22:	0.	0.	3.	0.	3.	2.	0.	5.	0.	0.	0.	1.
23:	0.	0.	208.	35.	93.	95.	7.	12.	0.	0.	0.	
24:												
25:	0.	0.	0.	0.	0.70	0.	0.	0.	0.	0.	0.	0.
26:	0.	0.	104.17	17.65	78.20	63.39	3.53	25.77	0.	0.	0.	
27:												
28:	0.	0.	1.00	0.	1.00	0.	0.	1.00	0.	0.	0.	0.
29:	0.	0.	68.00	11.00	30.00	28.00	0.	2.00	0.	0.	0.	
30:												
31:	0.	0.	0.	0.	1.00	0.	0.	0.	0.	0.	0.	0.
32:	0.	0.	107.00	19.00	84.00	68.00	4.00	26.00	0.	0.	0.	
33:												
34:	0.	0.	0.	0.	5.00	2.00	0.	4.00	0.	0.	1.00	0.
35:	0.	0.	129.00	1.00	40.00	37.60	3.73	9.00	0.	0.	0.	
36:												
37:	0.	0.	0.	0.	20.	29.	0.	25.	0.	5.	2.	1.
38:	0.	2.	193.	2.	45.	101.	32.	16.	3.	0.	0.	
39:												
40:	0.	0.	0.	0.	0.44	0.	0.	0.	0.	0.	0.	0.
41:	0.	0.	133.65	17.64	77.14	62.44	3.41	25.77	0.	0.	0.	
42:												
43:	0.	0.	0.84	0.	0.76	0.	0.	0.89	0.	0.	0.	0.
44:	0.	0.	62.52	9.04	23.96	22.36	0.	1.99	0.	0.	0.	
45:												
46:	0.	0.	0.	0.	0.80	0.	0.	0.	0.	0.	0.	0.
47:	0.	0.	105.31	18.31	80.51	65.17	3.69	25.64	0.	0.	0.	
48:												
49:	0.	0.	0.	0.	0.26	0.47	0.	2.91	0.	0.	0.82	0.
50:	0.	0.	100.71	0.57	21.74	20.51	1.00	8.31	0.	0.	0.	
51:												
52:	0.	0.	1.	0.	1.	0.	0.	1.	0.	0.	0.	0.
53:	0.	0.	68.	11.	30.	28.	0.	2.	0.	0.	0.	
54:												
55:	0.	0.	0.	0.	1.	0.	0.	0.	0.	0.	0.	0.
56:	0.	0.	107.	19.	84.	68.	4.	26.	0.	0.	0.	
57:												

Figure III.2.3

CHAPTER 3

UTILITY: WIMP/TOE-IN

3.1 DESCRIPTION - The purpose of the utility, WIMP/TOE-IN, is to produce a Table of Organization, Equipment (TOE) for each type of Blue (force's) unit represented in a stylized (force's) posture array. Each TOE is unique and prepared from the artillery vulnerability categories. Therefore, each unit's equipment level (quantity) is defined in terms of one of the equipment types represented as an artillery vulnerability category. The quantity of equipment input is the basis for the assessment or loss computations to follow in the WIMP. Additionally, edit checks are made as each type unit code is input from the WIMP unit file to insure correctness. Personnel losses are not computed by the program; however, personnel are treated as category 1 throughout the WARRAMP methodology, and to obviate these computations in the programs to follow, category 1 data fields are set to zero by this program. This program produces one (output) file during execution. It must be run for each stylized posture, which, as a result produces a complete set of TOE's for the force simulated across the different postures. This utility program is designed to support the WARF INTERMEDIATE MATERIEL PROCESSOR by preparing the TOE's for each posture (attack, defense intense, delay, defense light).

3.2 STRUCTURE - The features of the WIMP/TOE-IN utility program is presented in Figure III.3.1. The relationship to this program to the WARRAMP methodology is presented in Section II. This program must be run (executed) for each desired output (TOE by posture) file pictured.

3.3 DATA BASE - The WIMP/TOE-IN utility program requires the following system resident-mass storage data files:

88. RAM/MATRIX: The input data reflecting the type unit identification and the authorized TOE equipment level by artillery vulnerability category. This data file is produced by the utility called RAM/MATRIX.

82WIMPDATA.UNITXXX: The input data presenting the posture array data by unit as used by the COSAGE simulation. This is data for one posture. The "XXX" portion of the element name should be edited out during file element generation from the source file and replaced with an appropriate "-AT" (attack), "-DI" (Defense Intense), "-DE" (delay), or "-DL" (Defense Light) to assist in maintaining a data audit trail.

3.4 RUNSTREAM - Figure III.3.2 depicts the runstream or start file to be utilized to execute this utility. The runstream must be prepared for execution by editing. The file element presented is intended to be executed in the demand mode (from a terminal) by entering an @ADD CSTART*82XQT.WIMP/TOE-IN. A Run card and finish (@FIND) card would be necessary to operate in the batch environment, using demand mode entry of the run (program). The following functions are performed by the runstream:

- o Logical unit 7 (File 7) is temporarily assigned, and in to which the FN.RAM/MATRIX data for the appropriate study is edited (copied).

- o Logical unit 8 (File 8.) is temporarily assigned, and into which a selected COSAGE unit data file is edited (copied). This is one of the planned posture (array) sets.

- o Logical unit 9 (File 9.) is temporarily assigned as the output (write) file to contain the results of execution of this utility program.

- o The program is executed. One data error condition will cause the program to terminate: If the number of type units input from the RAM/MATRIX data file exceeds 499.

- o The contents of the temporary file 9. are edited (copied into) the file element 88.TOE-IN-XX., 20 lines of the file element are edited (printed) in the users run (PRINT$) file and a normal exit is made. The "XX" portion of the file element name should be changed (edited) to agree with the "UNITXXX" label to maintain the data audit trail.

- o The program files assigned temporarily to the run are released to the system.

3.5 INPUT - An execution of the WIMP/TOE-IN program requires two input data files. The first data file is the PF.RAM/MATRIX data file element. It is produced by an execution of the utility: RAM/MATRIX discussed in Chapter 11. A sample input data file is presented in Figure III.3.3.

The following is the file format:

FILE .RAM/MATRIX
STORAGE MEDIUM: Mass Storage Device
SOURCE: Output from Utility RAM/MATRIX

RECORD FORMAT:

Position	Description	Field Format
1	Blank	1X
2 - 3	Type unit code, first 2 characters of type unit code	A2
4 - 5	Subscript to the above code	I2
6 - 93	Integer quantities of equipment TOE levels by vulnerability group (22 each)	22(I4)

The second input data file contains the unit data of the stylized blue force array for a given posture. The source data is the same as that prepared (arrayed for) COSAGE. The program expects a formatted data on records as shown below; if a zero record or data field is found, the next record is read. A sample input data file is in Figure III.3.4.

FILE .UNITXXX
STORAGE MEDIUM: Mass Storage Device
SOURCE: Created manually or by SUSF for COSAGE

RECORD FORMAT:

Position	Description	Field Format
1 - 6	Skipped (Blank)	6X
7 - 9	Unit Sequence Number	I3
10 - 12	Skipped (Blank)	3X
13 - 14	Type Unit Code	I2

3.6 OUTPUT - An execution of the WIMP/TOE-IN program produces one output file element, PF.TOE-IN-XX.. Editing of the runstream is needed to replace the "xx" in the element name and catalog the output file element according to the posture for the audit trail. Sample output is presented in Figure III.3.5. The formated write is all in decimal and two records are required for each Type Unit (TOE), with a blank record between each type unit. The first value is for personnel and is always zero. There are 22 values per type unit. The type unit values are sequential and not reflected on the output.

FILE: PF.TOE-IN-XX
STORAGE MEDIUM: Mass Storage

RECORD FORMAT: (2 RECORDS required)

Position	Description	Field Format
Record 1:		
1	Skip (Blank)	1X
2 - 8	Personnel Quantity	22(F7.2)
9 - 96	Equipment Quantity	1X11(F7.2)
Record 2:		
1 - 89	Equipment Quantity	1X11(F7.2)

3.7 PERFORMANCE - The execution of this utility program requires the following resources:

CORE:	Less than 10K
CPU TIME:	Less Than 1 Minute
CLOCK TIME:	Less Than 5 Minutes
DISK (FILE) UNITS:	3 each with default (128 tracks) space
COMMENTS:	The program will terminate during the input of the .UNITXXX data if the number of unit types exceeds 499.

WIMP/TOE-IN STRUCTURE

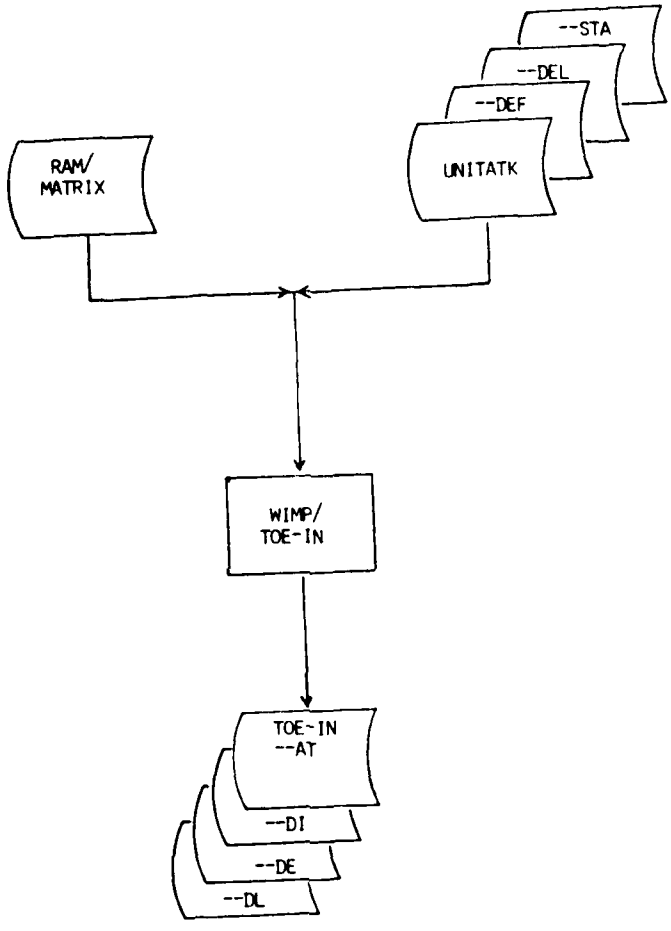


Figure III.3.1

```
UNCLASSIFIED***FILE NAME:CSTART*F2XQT  ELEMENT NAME:WIMP/TOE-IN***UNCLASSIFIED

  1:*USE 88.,SECRET*F2*/NOFORN.
  2:*ASK,A 80/    /   .
  3:*ASG,T 7.
  4:*ASG,A F2*IMPDATA.
  5:*FQ   85.RAM/MATRIX,7.
  6:EXIT
  7:*MSG,N  THE ABOVE ELEMENT "RAM/MATRIX-I" CONTAINS THE
  8:*MSG,N  TOE EQUIPMENT AUTHERIZED EACH TYPE UNIT
  9:*MSG,N  BY ARTILLERY VULNERABILITY CATEGORY.
 10:*ASG,T 8.
 11:*FQ   F2*IMPDATA.UNITXXX,8.
 12:EXIT
 13:*MSG,N  THE ABOVE ELEMENT "UNITXXX" CONTAINS THE
 14:*MSG,N  UNIT DATA FOR A POSTURE'S ARRAY AS USED
 15:*MSG,N  IN COSAGE.  THE "XXX" PORTION OF THE
 16:*MSG,N  ELEMENT NAME MUST BE CHANGED TO REFLECT THE
 17:*MSG,N  APPROPRIATE POSTURE.
 18:*ASG,T 9.
 19:*ASG,A F2*IMP.
 20:*XQT F2*IMP.*IMP/TOE-IN
 21:*FQ   9*,85.TOE-IN-XX
 22:LNM .0
 23:LAST
 24:EXIT
 25:*MSG,N  THE ABOVE ELEMENT "TOE-IN-XX" WILL CONTAIN
 26:*MSG,N  THE OUTPUT DATA PRODUCED BY THIS UTILITY.
 27:*MSG,N  THE "XX" PORTION OF THE ELEMENT NAME MUST
 28:*MSG,N  BE CHANGED TO REFLECT THE APPROPRIATE
 29:*MSG,N  POSTURE.
 30:*FREE 7.
 31:*FREE 8.
 32:*FREE 9.
 33:*FREE 88.
```

Figure III.3.2

UNCLASSIFIED•••EXAMPLE OF THE OUTPUT DATA OF UTILITY RAM/MATRIX•••UNCLASSIFIED

1:	CH01	0	0	0	23	22	0	24	0	0	0	0	0	0	121	13	37	24	73	1	0	0	9
2:	EN02	0	0	4	55	88	0	86	0	20	10	0	0	4	1142	79	315	271	101	147	20	0	15
3:	EN03	0	0	0	24	32	0	24	0	7	2	0	0	4	202	9	55	71	43	11	7	0	15
4:	EN04	0	0	0	5	9	0	12	0	2	2	0	0	0	134	15	51	76	9	30	4	0	0
5:	EN05	0	0	4	11	20	0	14	0	5	0	0	0	0	160	6	56	56	22	16	3	0	0
6:	FA06	0	0	0	35	14	0	17	0	2	0	0	0	0	215	10	62	171	37	25	1	0	0
7:	FA07	0	19	0	43	39	0	24	0	5	0	2	54	2	645	74	136	356	78	118	3	0	0
8:	FA08	0	0	0	29	3	0	13	0	1	0	0	0	0	240	17	51	234	43	73	2	0	0
9:	FA09	0	6	0	3	6	0	2	0	1	0	0	15	0	108	17	22	34	8	13	0	0	0
10:	FA10	0	0	0	5	18	0	5	0	1	0	2	9	2	91	6	19	20	11	6	1	0	0
11:	FA11	0	19	0	59	54	0	37	0	21	1	2	48	0	767	82	170	416	115	106	7	0	0
12:	FA12	0	1	0	34	4	0	15	0	1	0	0	0	0	234	20	61	224	53	58	1	0	0
13:	FA13	0	4	0	4	8	0	3	0	1	0	0	12	0	105	14	21	37	8	10	1	0	0
14:	FA14	0	6	0	7	3	0	4	0	1	0	0	0	0	94	11	26	58	25	11	1	0	0
15:	FA15	0	0	0	6	23	0	9	0	16	1	2	12	0	174	9	20	23	13	7	2	0	0
16:	FA16	0	12	0	42	42	0	28	0	5	1	2	42	0	544	57	123	210	53	64	1	0	0
17:	FA17	0	0	0	27	3	0	16	0	1	0	0	0	0	145	11	41	93	19	21	0	0	0
18:	FA18	0	4	0	3	7	0	2	0	1	0	0	11	0	104	13	22	32	8	12	0	0	0
19:	FA19	0	0	0	6	18	0	6	0	1	1	2	9	0	97	7	16	21	10	7	1	0	0
20:	FA20	0	30	0	78	74	0	40	0	58	0	2	0	0	542	19	82	321	101	23	1	0	0
21:	FA21	0	0	0	24	11	0	19	0	1	0	2	0	0	125	4	19	75	26	14	1	0	0
22:	FA22	0	10	0	18	21	0	7	0	19	0	0	0	0	139	5	21	82	25	3	0	0	0
23:	ME23	0	13	0	34	31	0	46	0	5	0	6	0	2	976	142	459	452	43	87	3	0	0
24:	ME24	0	0	0	14	23	0	19	0	5	0	2	0	2	194	21	43	74	29	15	3	0	0
25:	ME25	0	3	0	3	2	0	5	0	0	0	1	0	0	209	35	93	95	3	12	0	0	0
26:	ME26	0	1	0	1	0	0	1	0	0	0	0	0	0	68	11	30	28	0	2	0	0	0
27:	ME27	0	4	0	11	2	0	12	0	0	0	1	0	0	168	18	137	93	5	30	0	0	0
28:	MD28	0	0	0	69	35	0	58	0	8	0	0	0	0	400	0	58	80	50	16	4	0	0
29:	MD29	0	0	0	27	14	0	28	0	2	0	0	0	0	154	0	22	41	23	4	1	0	0
30:	MD30	0	0	0	14	7	0	10	0	2	0	0	0	0	92	0	12	13	9	4	1	0	0
31:	MD31	0	0	0	6	21	0	30	0	2	0	0	0	0	126	0	16	34	16	2	62	0	1
32:	MD32	0	0	0	45	2	0	6	0	1	0	0	0	0	102	0	15	22	13	3	0	0	0
33:	MD33	0	0	0	9	9	0	17	0	2	0	0	0	0	130	0	72	241	74	57	2	0	0
34:	OR34	0	0	0	8	40	0	13	0	6	0	0	0	0	291	4	21	59	25	5	4	0	0
35:	OR35	0	0	0	11	43	0	26	0	3	0	0	0	0	139	12	17	59	16	10	0	0	0
36:	OR36	0	0	0	2	35	0	20	0	13	0	0	0	1	171	9	47	44	23	3	8	0	0
37:	AD37	0	0	0	11	23	0	10	0	3	0	0	0	0	129	4	14	38	13	1	7	0	0
38:	AD38	0	0	0	23	17	0	16	0	6	0	0	0	0	119	3	12	44	10	2	11	0	0
39:	GM39	0	0	0	9	14	0	12	0	6	0	0	0	0	129	4	12	18	10	4	0	6	0
40:	GM40	0	0	0	11	24	0	13	0	5	0	0	0	0	197	3	23	89	28	5	2	2	0
41:	SC41	0	0	0	162	45	0	59	0	4	0	0	0	0	709	10	63	952	189	698	9	0	0
42:	SC42	0	0	0	13	18	0	19	0	1	0	0	0	0	104	1	17	109	24	3	9	0	0
43:	SC43	0	0	0	52	10	0	17	0	1	0	0	0	0	234	4	16	352	60	224	0	0	0
44:	SC44	0	0	0	47	5	0	8	0	1	0	0	0	0	132	4	15	217	45	132	0	0	0
45:	SC45	0	0	0	50	12	0	15	0	1	0	0	0	0	199	1	15	274	60	339	0	0	0
46:	AG46	0	0	0	7	4	0	8	0	2	0	0	0	0	289	4	7	17	7	2	1	0	0
47:	FC47	0	0	0	2	2	0	3	0	0	0	0	0	0	94	3	7	13	6	1	0	0	0
48:	AP48	0	0	0	30	5	0	27	0	1	0	0	0	0	191	4	29	60	29	1	2	0	0
49:	AP49	0	4	2	44	77	0	47	0	5	5	2	0	0	694	24	249	286	48	69	3	0	0
50:	AP50	0	0	0	20	29	0	25	0	5	2	1	0	0	193	2	45	101	32	16	3	0	0
51:	AP51	0	0	0	5	2	0	4	0	0	1	0	0	0	129	1	40	33	4	9	0	0	0
52:	AP52	0	0	0	1	0	0	0	0	0	0	0	0	0	42	0	10	8	0	2	0	0	0
53:	AP53	0	4	2	9	2	0	10	0	0	0	1	0	0	107	19	84	68	4	26	0	0	0
54:	CA54	0	0	0	19	4	0	14	0	1	0	1	0	0	107	6	19	67	26	3	2	0	0
55:	CA55	0	9	0	44	46	0	43	0	6	3	2	2	31	039	109	540	506	70	183	6	2	0
56:	CA56	0	0	0	26	24	0	19	0	5	0	2	0	3	208	39	47	89	27	23	3	0	0
57:	CA57	0	0	0	6	16	0	15	0	1	0	0	2	0	725	13	103	198	19	64	3	2	0
58:	CA58	0	3	0	4	2	0	3	0	0	1	0	0	0	202	19	130	73	8	32	0	0	0
59:	CA59	0	1	0	0	0	0	0	0	0	0	0	0	0	65	6	40	21	2	10	0	0	0
60:	AH60	0	0	0	44	40	0	76	0	7	0	0	0	0	893	10	260	776	99	260	7	19	0
61:	AH61	0	0	0	14	7	0	16	0	4	0	0	0	0	143	4	29	89	23	11	1	1	0
62:	AH62	0	0	0	10	11	0	20	0	1	0	0	0	0	250	3	77	229	22	83	2	6	0
63:	MP63	0	0	0	61	1	0	56	0	0	0	0	0	0	367	1	65	103	19	12	0	0	0
64:	OR64	0	0	0	9	5	0	12	0	1	0	0	0	0	192	4	10	26	10	1	0	1	0
65:	OM65	0	0	0	6	2	0	7	0	1	0	0	0	0	47	4	8	22	3	0	2	0	0
66:	OR66	0	0	0	53	136	0	110	0	53	4	0	0	01	068	19	95	252	140	10	95	0	0
67:	OR67	0	0	0	8	23	0	11	0	22	0	0	0	0	119	3	15	77	14	3	10	0	0
68:	OM68	0	0	0	5	23	0	19	0	6	1	0	0	0	193	3	11	39	24	5	18	0	0
69:	OR69	0	0	0	7	27	0	26	0	7	1	0	0	0	251	4	25	14	24	4	20	0	0

Figure III.3.3

```
UNCLASSIFIED***EXAMPLE OF WIMP INPUT FILE UNITXXX***UNCLASSIFIED

   1: 277              001  002  003  005  006  007  008  010  011  012
   2:                  013  015  016  017  018  020  021  022  023
   3:                  025  026  027  028  031  057  071  072  075  035
   4:                  036  037  038  040  041  042  043  045  058  046
   5:                  047  048  050  051  052  053  055  059  060
   6:
   7:                  061  062  063  065  066  067  068  070  071  072
   8:                  073  075  110  076  077  078  080  081  082  083
   9:                  085  086  087  088  090  117  091  092  093  095
  10:                  096  097  098  100  101  102  103  105  118  106
  11:                  107  109  110  111  112  113  115  119  120  105
  12:                  106  107
  13:
  14:                  121  122  123  124  126  127  128  130  171  132
  15:                  133  135  136  136  137  138  140  141  142  143
  16:                  145  146  147  149  150  177  151  152  157  155
  17:                  156  157  158  159  161  162  163  165  178  166
  18:                  167  169  170  171  172  173  175  179  180
  19:
  20:                  201  202  203  205  206  207  208  210  211  212
  21:                  213  215  216  217  218  220  221  222  223  225
  22:                  226  227  228  230  231  232  233  235  236  237
  23:                  238  239  240  241  242  243  245  246  250
  24:
  25:
  26:                  502  503  513  505  506  507  508  510  511  512
  27:                  513  515  516  517  518  518  519  520  591  500
  28:
  29:                  601  602  603  605  606  607  608  610  611  612
  30:                  613  614  615  620  691  500
  31:
  32:                  701  702  703  705  706  707  708  710  711  712
  33:                  713  714  791  707
  34:
  35:                  801  802  803  804  805  806  807  808  809  810
  36:                  811  812  813  814  815  816  817  820  821  822
  37:                  823  826  827  830  831  832  835  836  837  838
  38:                  839  840  841  842  845  897  898  899
  39:
  40:
  41: 001  001   11  3900 3920 005    2   150                          2
  42:                 05  005  1          005  1  1    006  1  1    007  1  1   999
  43:                 05  001  2          020  1  1                              999
  44:                 14  002  2          026  1  1                              999
  45:                                                                           999
  46: 002  002   05  3900 3780 005    2   150                          2
  47:                 01  004  2          011  1  1                              999
  48:                 07  004  1          017  1  1                              999
  49:                 05  001  2          020  1  1                              999
  50:                 14  001  2          026  1  1                              999
  51:                 20  001  2          031  1  1                              999
  52:                                                                           999
  53: 007  003   11  3900 3740 005    2   150                          2
  54:                 05  005  1          015  1  1    006  1  1    007  1  1   999
  55:                 05  001  2          020  1  1                              999
  56:                 14  002  2          026  1  1                              999
  57:                                                                           999
```

Figure III.3.4

UNCLASSIFIED***EXAMPLE OF OUTPUT DATA OF UTILITY WIMP/TOE-IN***UNCLASSIFIED

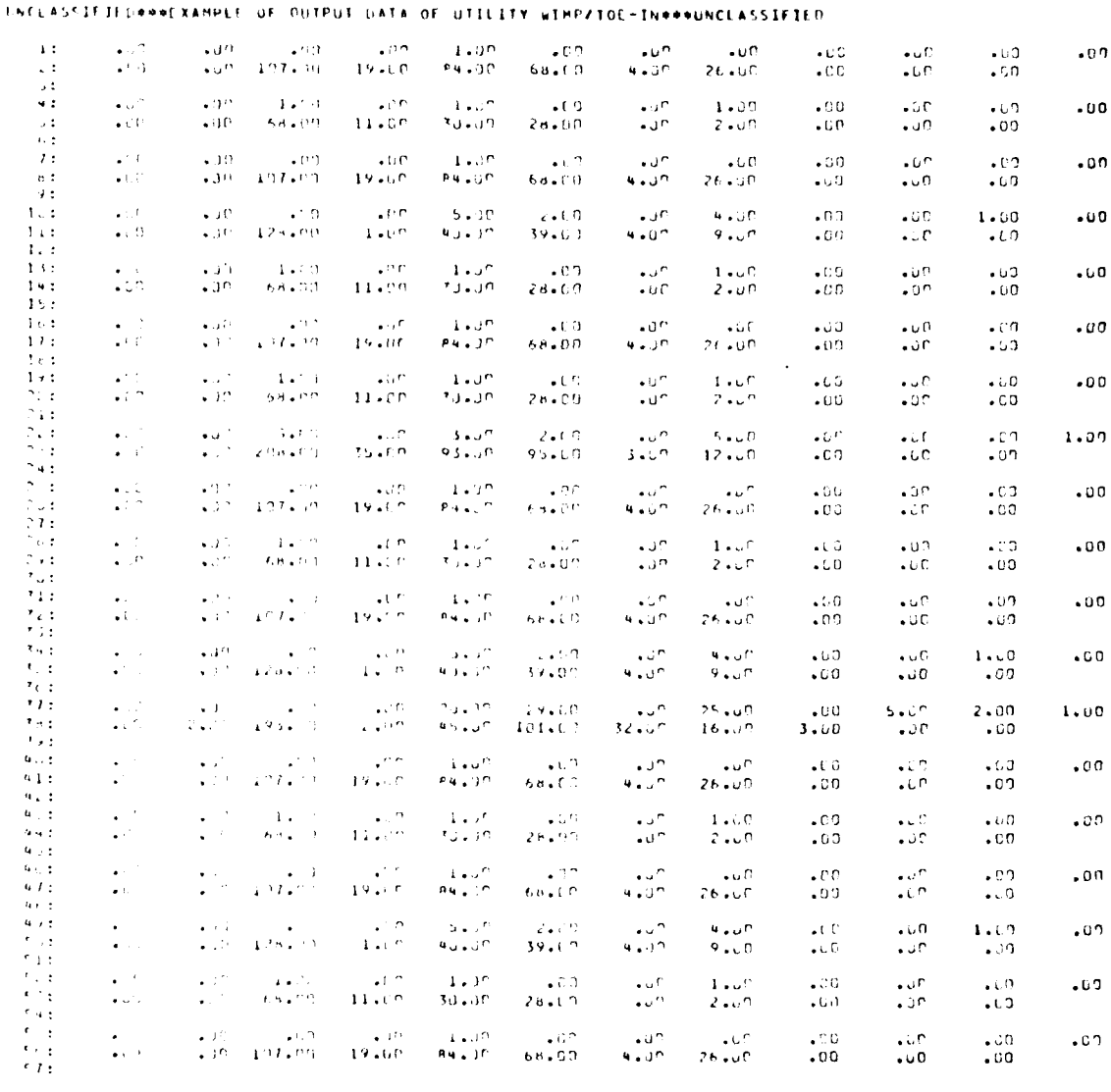


Figure III.3.5

CHAPTER 4
UTILITY: WIMP/LOSS-RATES

4.1 DESCRIPTION - The purpose of this utility program is to process the output from the WARF INTERMEDIATE MATERIEL PROCESSOR (WIMP) and computes the average equipment loss rates by vulnerability category (including personnel), for each combat posture modeled. The output is manually input (by system editor applicatin) to the CONTROL/TEMP input data file. For a given posture (unit and force data) multiple runs of the WIMP may be made to satisfy the required statistical confidence level for a study. The output from each WIMP run (execution) is merged by this program. The computations sum (total) the losses for each type unit represented in the array, across each artillery vulnerability group and computes the average loss per vulnerability group. The average loss is divided by the total items (produced by WIMP/TOTAL-CAT) per posture to yield the loss rate and loss data by posture for each artillery equipment vulnerability group.

4.2 STRUCTURE - A schematic of the functions of the WIMP/LOSS-RATES utility program is in Figure III.4.1. A single run (execution) processes only one of the force postures modeled.

4.3 DATA BASE - The WIMP/LOSS-RATES program requires the following system resident-mass storage data files. These files generally are prepared for a given study and are not incorporated into a permanent data base structure. For long-term retention, they may be individually copied onto tape or archieved. If appropriately cataloged, they will be retained through the periodic system "secures" when all system resident files are copied onto tape.

88.WIMP/XX-N: An input data file produced by the WIMP program. Multiple files of this structure may be used as data samples containing losses by each blue (force) unit ina given posture (array). When multiple files are used, the "xx" must be edited out of the runstream and replaced by the appropriate posture symbol (AT = Attack, DL = Defense Light, DE = Delay, DI = Defense Intense). The "N" value should be changed to reflect the sequence number of the (iterative) run that produced this file. These techniques enable a user to maintain a data audit trail for data verification and study report preparation.

88.WIMP-XX/TOTAL-CAT: An input data file produced by the utility program WIMP/TOTAL-CAT. A single copy of this file is required per posture (force array) modeled. The "xx" portion of the file element name must be changed (edited) to reflect the appropriate posture symbol as discussed above, for the purposes of auditing.

RUN DATA: The program execution runstream requires two data values, the total number of blue units in the posture (force) array, and the number of copies of the WIMP/XX-N file to be executed.

4.4 RUNSTREAM - The program execution runstream is depicted in Figure III.4.2. The file element is designed to be executed in the demand mode. Once the file is edited at the terminal to replace the "xx" and "N" value and introduce the unit quantity and "N" on line 39, it may be executed by entering the @ADD command followed by options and the file name and element name. The execution runstream is within a break-pointed file and that file (82PRINT., in this case) would need to by @SYM'd for hard (print) copy. The following actions re performed in the runstream:

- o The breakpoint file (XXPRINT.) is established.
- o The cataloged file containing the data input/output files is designed as 88. by the @USE command.
- o The temporary file 7. is assigned and through the @DATA,I command the data files for the sample results from the WIMP for a posture are added (copied) to it.
- o The temporary file 9. is assigned and through the @DATA,I command, the TOTAL-CAT data is input (copied) to the file.
- o The temporary files (logical) 8., 10., and 11. are assigned to support the program execution.
- o The program execution is started (@XQT) followed by the additin of two data values as shown on record (line) 39. The first integer value is the total number of blue nits in the force modeled (arrayed) and the integer number of the quantity of loss samples (example is 10) input from the WIMP.
- o The input file element .WIMP-XX/TOTAL-CAT is printed in its entirety via the @ED command.
- o The output from the execution is edited (copied) into the file element .WIMP/LOSS-XX and the contents printed in its entirety via the @ED command.
- o The file is break pointed (XXPRINT.) and the editor entered for the terminal operator to review (edit) the file.

4.5 INPUT - An execution of the WIMP/LOSS-RATES utility program requires two types of input data files plus runstream data. The first data file is the .WIMP/XX-N element. At least 1 copy of the file is required; as many as required to satisfy the study requirements will be used. The sample output is shown in Figure III.4.3. The file format is as follows:

FILE: .WIMP/XX-N
STORAGE MEDIUM: Mass Storage Device
SOURCE: Output from WIMP program

RECORD FORMAT: Two (2) records are required for each type unit modeled inthe force array, separated by a blank line. The two records contain the one decimal entry for each artillery vulnerability category modeled (22 is current methodology).

The second file required for input is the file element .WIMP-XX/TOTAL-CAT. The data sample is depicted in Figure III.4.4. The file format is as follows:

FILE: .WIMP/TOTAL-CAT
STORAGE MEDIUM: Mass Storage Device
SOURCE: Output from the utility .WIMP/TOTAL-CAT

RECORD FORMAT: The file contains 23 records, one for personnel plus one for each artillery vulnerability category (22 each).

Position	Description	Field Format
1	Blank	1X
2 - 11	Total items	I10

4.6 OUTPUT - An execution of the WIMP/LOSS-RATES utility program produces two types of output data and files. One execution of the program is required for each posture modeled (arrayed). One output is the computed losses of equipment in a vulnerability group, the second is the loss rate, a percent based upon the total items available in the force array (posture). The first file presented is the loss file depicted in Figure III.4.5. The file format is as follows:

FILE: .WIMP/LOSS-XX
STORAGE MEDIUM: Mass Storage Device
SOURCE: Output from the utility WIMP/LOSS-RATES

RECORD FORMAT: The file contains 23 records; one for personnel plus one for each artillery vulnerability category modeled (22 each).

Position	Description	Field Format
1	Blank	1X
2 - 11	The equipment losses	F10.2

The second file, .WIMP/RATES-XX is depicted in Figure III.4.6. The format is as follows:

FILE: .WIMP/RATES-XX
STORAGE MEDIUM: Mass Storage Device
SOURCE: Output from the utility WIMP/LOSS-RATES

RECORD FORMAT: The file element contains 23 records; one for personnel plus one for each vulnerability category modeled (22 each).

Position	Description	Field Format
1 - 7	The decimal loss percent	F7.5

4.7 PERFORMANCE - The execution of this utility program requires the following resources:

CORE:	LESS THAN 10K
CPU TIME:	LESS THAN 1 MINUTE
CLOCK TIME:	LESS THAN 5 MINUTES
DISK (FILE) UNITS:	5 each with default (128 tracks) space
COMMENTS:	The Start file will require additional cards (records) to be operated in a batch environment.

WIMP/LOSS-RATES STRUCTURE

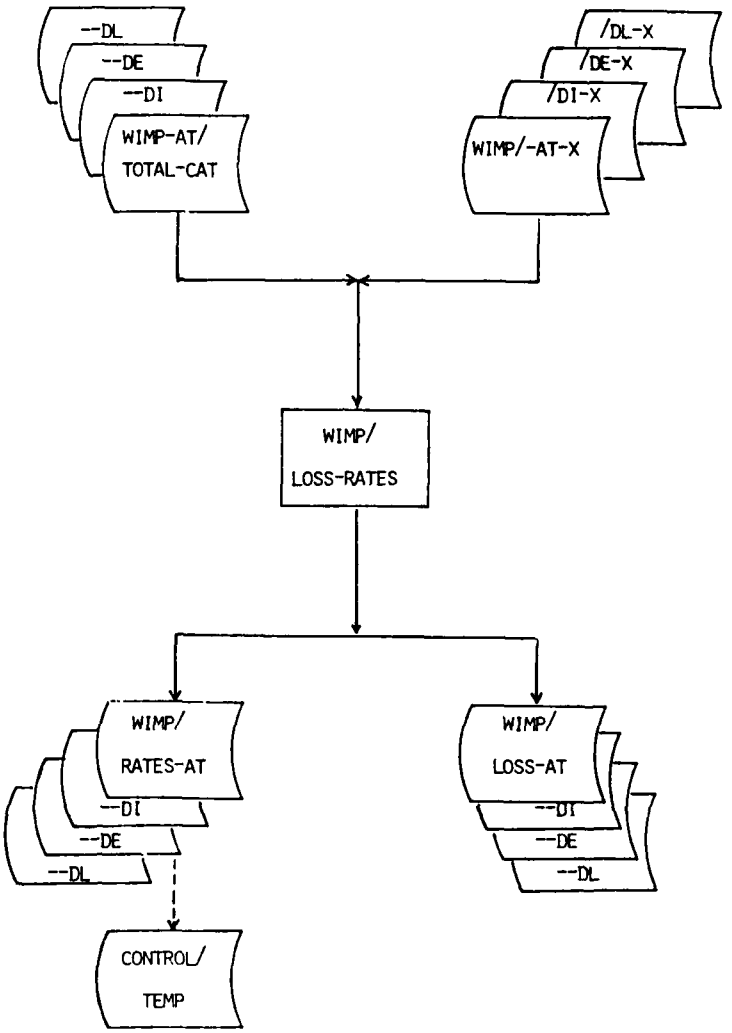


Figure III.4.1

```
UNCLASSIFIED***FILE NAME:CSTART*R2XQT  ELEMENT NAME:WIMP/LOSS-RATE***UNCLASSIFI

  1:@RMPT PRINT1/8^PRINT
  2:@USE 66.,SECRET*R2.ANFP98.
  3:@ASG,A 88/    /    .
  4:@ASG,T 7.
  5:@DATA,1   7.
  6:@ADD,D  88.WIMP/XX-1
  7:@ADD,D  88.WIMP/XX-2
  8:@ADD,D  88.WIMP/XX-3
  9:@ADD,D  88.WIMP/XX-4
 10:@ADD,D  88.WIMP/XX-5
 11:@ADD,D  88.WIMP/XX-6
 12:@ADD,D  88.WIMP/XX-7
 13:@ADD,D  88.WIMP/XX-8
 14:@ADD,D  88.WIMP/XX-9
 15:@ADD,D  88.WIMP/XX-10
 16:@END
 17:@MSG,N   THE ABOVE ELEMENTS ARE THE SEPARATE OUTPUTS FROM
 18:@MSG,N   EACH RUN OF THE WIMP FOR A SINGLE POSTURE (IE. ATTACK, DEF-
 19:@MSG,N   ENSE INTENSE, DELAY OR DEFENSE LIGHT).  THE "XX"
 20:@MSG,N   PORTION OF THE ELEMENT NAME MUST BE CHANGED TO REFLECT
 21:@MSG,N   THE CORRECT POSTURE (IE. AT, DI, DE OR DL).  THE NUMBER OF
 22:@MSG,N   ELEMENT FILES MAY ALSO CHANGE DEPENDING ON THE
 23:@MSG,N   NUMBER OF TIMES THE WIMP IS EXECUTED FOR ANY ONE
 24:@MSG,N   POSTURE.
 25:@ASG,T 9.
 26:@DATA,1  9.
 27:@ADD,D   88.WIMP-XX/TOTAL-CAT
 28:@END
 29:@MSG,N   THE ABOVE ELEMENT "WIMP/TOTAL-CAT-XX" CONTAINS THE RB
 30:@MSG,N   DATA FROM UTILITY S2WIMP.WIMP/TOTAL-CAT.  THIS UTILITY IS
 31:@MSG,N   EXECUTED ONCE FOR EACH POSTURE.  THE "XX" PORTION OF THE
 32:@MSG,N   ELEMENT NAME MUST BE CHANGED TO REFLECT THE APPROPRIATE
 33:@MSG,N   POSTURE (IE. AT, DI, DE OR DL).
 34:@ASG,T 8.
 35:@ASG,T 10.
 36:@ASG,T 11.
 37:@ASG,A R2WIMP.
 38:@XQT R2WIMP.WIMP/LOSS-RATES
 39: 199 10
 40:@MSG,N   THE ABOVE NUMBERS REPRESENT THE NUMBER OF BLUE UNITS IN
 41:@MSG,N   THE POSTURE'S ARRAY AND THE NUMBER OF TIMES THE WIMP
 42:@MSG,N   WAS EXECUTED FOR THIS POSTURE.  THE FORMAT FOR THIS
 43:@MSG,N   ENTRY IS COLUMN 1 = BLANK, COLUMNS 2-4 = BLUE UNIT COUNT,
 44:@MSG,N   COLUMN 5 = BLANK, COLUMNS 6-7 = NUMBER OF TIMES THE WIMP
 45:@MSG,N   WAS EXECUTED FOR THE POSTURE.
 46:@FD   66.,RB.WIMP/RATES-XX
 47:LOOP
 48:EXIT
 49:@MSG,N   THE ABOVE ELEMENT "WIMP/RATES-XX" WILL CONTAIN THE
 50:@MSG,N   OUTPUT DATA FROM THIS UTILITY.  THE "XX" PORTION OF
 51:@MSG,N   ELEMENT NAME MUST BE CHANGE TO REFLECT THE APPROPRIATE
 52:@MSG,N   POSTURE (IE. AT, DI, DE OR DL).
 53:@FD,R  RB.WIMP-XX/TOTAL-CAT
 54:LOOP
 55:EXIT
 56:@MSG,N   THE ABOVE ELEMENT "WIMP-XX/TOTAL-CAT" CONTAINS THE
 57:@MSG,N   TOTAL MIE IN EACH EQUIPMENT VULNERABILITY CATEGORY FOR THE
 58:@MSG,N   ENTIRE POSTURE'S ARRAY. THE "XX" PORTION OF THE
 59:@MSG,N   ELEMENT NAME MUST BE CHANGE TO REFLECT THE APPROPRIATE
 60:@MSG,N   POSTURE (IE. AT, DI, DE OR DL).
 61:@FD   11.,RB..WIMP/LOSS-XX
 62:LOOP
 63:EXIT
 64:@MSG,N   THE ABOVE ELEMENT "WIMP/LOSS-XX" CONTAINS THE
 65:@MSG,N   TOTAL MIE LOST IN EACH EQUIPMENT VULNERABILITY CATEGORY
 66:@MSG,N   FOR THE ENTIRE POSTURE'S ARRAY. THE "XX" PORTION OF THE
 67:@MSG,N   ELEMENT NAME MUST BE CHANGE TO REFLECT THE APPROPRIATE
 68:@MSG,N   POSTURE (IE. AT, DI, DE OR DL).
 69:@FREE 7.
 70:@FREE 6.
 71:@FREE 9.
 72:@FREE 10.
 73:@FREE 11.
 74:@FREE 88.
 75:@RMPT PRINTS
 76:@FD,R R2PRINT.
```

Figure III.4.2

UNCLASSIFIED***EXAMPLE OF KIMP OUTPUT DATA***UNCLASSIFIED

1:	0.	0.	0.	0.	1.	0.	0.	0.	0.	0.	0.	0.
2:	0.	0.	107.	19.	84.	68.	4.	26.	0.	0.	0.	
3:												
4:	0.	0.	1.	0.	1.	0.	0.	1.	0.	0.	0.	0.
5:	0.	0.	68.	11.	30.	28.	0.	2.	0.	0.	0.	
6:												
7:	0.	0.	0.	0.	0.71	0.	0.	0.	0.	0.	0.	0.
8:	0.	0.	101.31	17.38	75.98	58.56	2.29	25.67	0.	0.	0.	
9:												
10:	0.	0.	0.	0.	0.25	0.41	0.	2.81	0.	0.	0.77	0.
11:	0.	0.	98.72	0.54	19.73	19.24	1.06	8.24	0.	0.	0.	
12:												
13:	0.	0.	0.99	0.	0.93	0.	0.	0.29	0.	0.	0.	0.
14:	0.	0.	67.26	10.72	29.13	27.19	0.	1.99	0.	0.	0.	
15:												
16:	0.	0.	0.	0.	1.	0.	0.	0.	0.	0.	0.	0.
17:	0.	0.	107.	19.	84.	68.	4.	26.	0.	0.	0.	
18:												
19:	0.	0.	1.	0.	1.	0.	0.	1.	0.	0.	0.	0.
20:	0.	0.	68.	11.	30.	28.	0.	2.	0.	0.	0.	
21:												
22:	0.	0.	3.	0.	3.	2.	0.	5.	0.	0.	0.	1.
23:	0.	0.	208.	35.	93.	95.	7.	12.	0.	0.	0.	
24:												
25:	0.	0.	0.	0.	0.70	0.	0.	0.	0.	0.	0.	0.
26:	0.	0.	104.17	17.65	78.20	63.30	3.53	25.77	0.	0.	0.	
27:												
28:	0.	0.	1.00	0.	1.00	0.	0.	1.00	0.	0.	0.	0.
29:	0.	0.	68.00	11.00	30.00	28.00	0.	2.00	0.	0.	0.	
30:												
31:	0.	0.	0.	0.	1.00	0.	0.	0.	0.	0.	0.	0.
32:	0.	0.	107.00	19.00	84.00	68.00	4.00	26.00	0.	0.	0.	
33:												
34:	0.	0.	0.	0.	5.00	2.00	0.	4.00	0.	0.	1.00	0.
35:	0.	0.	128.00	1.00	40.00	37.60	3.73	9.00	0.	0.	0.	
36:												
37:	0.	0.	0.	0.	20.	29.	0.	25.	0.	5.	2.	1.
38:	0.	2.	193.	2.	45.	101.	32.	16.	3.	0.	0.	
39:												
40:	0.	0.	0.	0.	0.64	0.	0.	0.	0.	0.	0.	0.
41:	0.	0.	103.65	17.64	77.14	62.44	3.41	25.77	0.	0.	0.	
42:												
43:	0.	0.	0.84	0.	0.36	0.	0.	0.80	0.	0.	0.	0.
44:	0.	0.	62.32	9.04	23.96	22.36	0.	1.94	0.	0.	0.	
45:												
46:	0.	0.	0.	0.	0.80	0.	0.	0.	0.	0.	0.	0.
47:	0.	0.	105.31	18.31	80.51	65.17	3.69	25.86	0.	0.	0.	
48:												
49:	0.	0.	0.	0.	0.36	0.47	0.	2.91	0.	0.	0.82	0.
50:	0.	0.	100.71	0.57	21.04	20.51	1.20	8.31	0.	0.	0.	
51:												
52:	0.	0.	1.	0.	1.	0.	0.	1.	0.	0.	0.	0.
53:	0.	0.	68.	11.	30.	28.	0.	2.	0.	0.	0.	
54:												
55:	0.	0.	0.	0.	1.	0.	0.	0.	0.	0.	0.	0.
56:	0.	0.	107.	19.	84.	68.	4.	26.	0.	0.	0.	
57:												

Figure III.4.3

UNCLASSIFIED***EXAMPLE OF THE OUTPUT OF UTILITY WIMP/TOTAL-CAT***UNCLASSIFIED

```
 1:      0
 2:      0
 3:    257
 4:      0
 5:   1051
 6:    718
 7:      0
 8:    952
 9:      0
10:    120
11:     30
12:     37
13:    369
14:     10
15:  25316
16:   2914
17:  10642
18:  14101
19:   1786
20:   3835
21:     91
22:     57
23:      0
```

Figure III.4.4

UNCLASSIFIED***EXAMPLE OF WIMP/LOSS-RATES OUTPUT FILE WIMP/LOSS-XX

```
 1:          .00
 2:          .00
 3:         4.31
 4:          .00
 5:        19.44
 6:        17.56
 7:          .00
 8:         1.79
 9:          .14
10:          .00
11:          .00
12:          .04
13:       100.15
14:          .00
15:        61.43
16:        39.59
17:        44.11
18:        27.41
19:        19.85
20:         2.25
21:         1.35
22:          .00
23:          .00
```

Figure III.4.5

UNCLASSIFIED***EXAMPLE OF WIMP/LOSS-RATES OUTPUT FILE WIMP/RATES-XX

```
 1: .[illegible]
 2: .[illegible]
 3: .01718
 4: .[illegible]
 5: .[illegible]
 6: .[illegible]
 7: .[illegible]
 8: .[illegible]
 9: .[illegible]
10: .[illegible]
11: .[illegible]
12: .[illegible]
13: .27141
14: .[illegible]
15: .[illegible]
16: .[illegible]
17: .[illegible]
18: .[illegible]
19: .01113
20: .[illegible]
21: .[illegible]
22: .[illegible]
23: .00000
```

Figure III.4.6

CHAPTER 5

UTILITY: LEA/TAPE

5.1 DESCRIPTION - The purpose of this utility is to process a magnetic tape supplied by the Logistics Evaluation Agency (LEA) which describes the Major Items of Equipment (MIE) being used in the current study as to the quantity and density profiles of each item by its Line Code (LINCODE). The utility will split the quantity and density profiles for each LINCODE and write them into separate sequential files; one for quantity profile and one for density profile. These files will be used as input to a following utility, ITMID/TEMP.

5.2 STRUCTURE - Figure III.5.1 depicts the general flow chart or structure for the utility.

5.3 DATA BASE- The LEA/TAPE utility uses the LEA tape as its only source of data and produces the two sequential files, Density, and Quantity Profiles. These files are discussed in more detail in section 5.5. The LEA tape file is supplied by the Logistics Evaluation Agency (LEA) on a magnetic tape with the following characteristics:

- Tracks = 9
- Blocking factor = 128
- Recording Density = 800 BPI

The two output files are written and stored on standard system mass storage devices.

5.4 RUNSTREAM - Figure III.5.2 depicts the runstream which is used to execute and control this utility. The utility performs the following functions:

- o Uses Logical Unit 7, the 9 Track LEA Tape is copied into the system.
- o Logical Units 8 and 9 are allocated for output.
- o Utility executed.
- o Text editor activated and the newly created QUANTITY/PROFILE and DENSITY/PROFILE files are copied into their permanent storage locations under the general file "SECRET *82WARF88. While doing so, the first 10 records of each files is printed for review.
- o Finally, all units allocated for the utility are released.

5.5 INPUT - The LEA/TAPE, provided by the Logistics Evaluation Agency (LEA), is the only input required by this utility. The format of the tape is depicted in Figure III.5.3.

This tape is provided to CAA on a study requirement basis.

The tape is referred to internally within LEA as WARF P-Study LINCODE DENSITY/QUANTITY, PROFILES TAPE.

5.6 OUTPUT - The utility produces two mass storage file ouptuts. One file is the DENSITY/PROFILES file. This file describes for each Major Item of Equipment (MIE), identified by its LINCODE, its density within each of the five combat zones, for each of the seven time periods being played. Density as described here is defined as the percentage of the available item of equipment which can be found in a combat zone during a specific time period. In all cases, the percentages for an item during a time period should sum to 100%. Thus, by multiplying the quantity of the item available for a given time period as described in the QUANTITY/PROFILES file, by the density percentage for a combat zone for that time period, the actual number of these items in this zone can be determined.

FILE: QUANTITY/PROFILES
STORAGE MEDIUM: Mass Storage
SOURCE: LEA/TAPE UTILITY

RECORD UTILITY:

Columns	Description	Format
1	Blank	1X
2 - 7	Line Code	A6
8 - 17	Blanks	10X
18 - 80	Quantity Profile for Periods 1 - 7	(9I)

The following presents a file layout for the DENSITY/PROFILES file as Figure III.5.4 presents an example of the data as it is found in the file. As can be seen from the file layout and the example, there will be five records for each MIE in the file; one record for each combat zone of the battle area. Further, within each record there will be eight occurrences of the actual density percentage of this item found within the combat zone; one for D-DAY and each of the seven time periods of the exercise.

FILE: DENSITY/PROFILES
STORAGE MEDIUM: Mass Storage
SOURCE: UTILITY LEA/TAPE

RECORD FORMAT:

Position	Description	Format
1	Blank	1X
2 - 7	Line Code	A6
8 - 18	Blanks	11X
19 - 53	Density Profiles for this Line Item for Periods 1-7	7(F5.1)

As can be seen from the record layout, there will be one record for each MIE and eight occurrences of its quantity; D-DAY and one for each time period. Figure III.5.5 presents an example of the data that can be found in the file.

5.7 PERFORMANCE - This utility requires the following resources be allocated in order to run:

CORE REQUIREMENTS:	LESS THAN 10K
CPU TIME:	1 MIN
CLOCK TIME:	5 MIN
COMMENTS:	NONE
Error Checks:	None

LEA/TAPE STRUCTURE

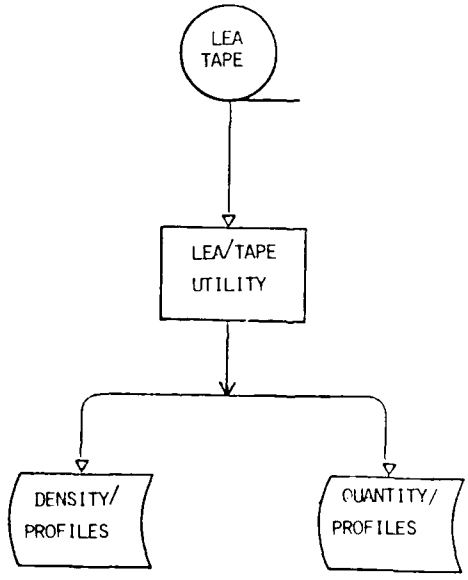


Figure III.5.1

```
UNCLASSIFIED***FILE NAME:SCSTART*82XQT  ELEMENT NAME:LEA/TAPE***UNCLASSIFIED

   1:&USE 8E..*SCRATCH*82WAREP88.
   2:&ASG,A 86/     /    .
   3:&ASG,T 82TAPE,*CC9,     R
   4:&MSG,N  THE ABOVE TAPE NUMBER MUST BE OBTAIN FROM THE TAPE
   5:&MSG,N  PROVIDED BY LEA, WHICH CONTAINS THE DENSITY AND
   6:&MSG,N  QUANTITY PROFILES ON THE LIN CODES BEING CONSIDERED
   7:&MSG,N  BY THE CURRENT STUDY (IN THIS EXAMPLE WARE P-88).
   8:&ASG,T 7.
   9:&COPY,O 82TAPE..7.
  10:&ASG,T 8.
  11:&ASG,T 9.
  12:&ASG,A 82XQT.
  13:&XQT 82XQT.LEA/TAPE
  14:&CP   9..*88.QUANTITY/PROFILES
  15:P 10
  16:LAS
  17:EXIT
  18:&MSG,N  THE ELEMENT FILE "QUANTITY/PROFILES" IS ONE OF THE
  19:&MSG,N  OUTPUTS OF THIS ROUTINE THAT WILL BE USED BY THE UTILITY
  20:&MSG,N  "82XQT.ITMID/TEMP" TO CREAT THE ITMID DATA FILE.
  21:&CP   9..*83.DENSITY/PROFILES
  22:P 10
  23:LAS
  24:EXIT
  25:&MSG,N  THE ELEMENT FILE "DENSITY/PROFILES" IS ONE OF THE
  26:&MSG,N  OUTPUTS OF THIS ROUTINE THAT WILL BE USED BY THE UTILITY
  27:&MSG,N  "82XQT.ITMID/TEMP" TO CREAT THE ITMID DATA FILE.
  28:&FREE 7.
  29:&FREE 8.
  30:&FREE 9
  31:&FREE 83.
```

Figure III.5.2

UNCLASSIFIED***EXAMPLE OF THE LINCODE/LIST DATA FILE***UNCLASSIFIED

```
   1: A03198  AK VEH M219 CM EQ EIA
   2: A14762  ADAP TEST CAMERA LM178
   3: A22436  AIMING CIRCLE MZ W/E
   4: A23770  AIR COND EL/WNDW 6000B
   5: A23328  AIR COND E/WA 9000 BTU
   6: A24044  AIR COND 13000 BTU
   7: A24318  AIR COND 18000 BTU
   8: A24455  AIR COND FM AIR-COOL
   9: A24463  AIR COND E/WA 18000 BT
  10: A24532  AIR COND 18000 BTU
  11: A24763  AIR COND E/WA 360008TUU
  12: A24900  AIR COND 36000 BTU
  13: A27159  AIR TRF C E AN/TSQ-97
  14: A32444  ALARM CML AGT M11
  15: A32508  ALARM CML AGT M12
  16: A32564  ALARM CML AGT AUTO
  17: A32568  ALARM CML AGT AUTO
  18: A32570  ALARM CML AGT AUTO
  19: A34457  ALGMT FX MX-3409/AAS24
  20: A41666  RDR SET AN/TPQ-37 LP
  21: A55293  ANAL CHG B AN/ASM-137
  22: A55300  ANAL CHG B AN/ASM-490
  23: A55304  ANAL CHG B AN/GSM-201
  24: A55704  ANAL FLT LN AN/ASM-80
  25: A56235  ANAL SET LS-89A
  26: A56243  ANAL SET ENG PTBL C 7
  27: A56800  ANAL SPTCM AN/UPM-59
  28: A56837  ANAL SPTCM AN/UPM-84
  29: A58033  ANAL SPTCM TS-723/U
  30: A77877  ANTENNA CRP AN/GRA-4
  31: A78014  ANTENNA GRP AN/GRA-12
  32: A78151  ANTENNA GRP AN/GRA-50
  33: A83347  ATTENUTR VAR CN-1035/G
  34: B01750  AUGER EARTH SM4A
  35: B11709  BOTTLE CLEANG AN/TAM-4
  36: B13648  BAKERY PLT M-1945LP
  37: B30236  BARGE ASSY SET 5X12
  38: B30323  BARGE DECK CGO NP OC
  39: B43683  BATH U FTBL GED LF
  40: B45597  BTRY CHGR PE7286% G/U
  41: B51038  BEACON SET AN/TRN-30V1
  42: B51039  BEACON SET AN/TRN-30V2
  43: B53711  BIN STG AGGR PTBL 60 T
  44: B67427  BINOCULAR EL AN/PAS-5
  45: B67432  BINOCULAR INFRARED
  46: B73532  BOAT BRDG ERECT GD 27
  47: B83856  BOAT LAND INFLT 15 MAN
  48: B84404  BOAT RECON ENFD 3-MAN
  49: C19481  BREAKER PAV-DRILL
  50: C20414  BRIDGE ARMD VEH
  51: C27056  BRIDGE ERECT SET FIX
  52: C27120  BRIDGE ERECT SET FB GK
  53: C27211  BRIDGE FXD HI-WAY AL UM
  54: C27217  BRIDGE FXD HI-WAY
  55: C27297  BRIDGE FLTG RAFT LT
  56: C27631  BRIDGE EREC SET
  57: C31120  BLDZR EM E/M60 SER TKS
```

Figure III.5.3

UNCLASSIFIED•••EXAMPLE DENSITY/PROFILE OUTPUT DATA FROM THE LEA/TAPE UTILITY•••U

1:	A03198	.0	.0	.0	.0	.0	.0	.0
2:	A03198	.0	.0	.0	.0	.0	.0	.0
3:	A03198	.0	.0	.0	.0	.0	.0	.0
4:	A03198	60.5	60.5	60.5	74.6	74.6	74.6	74.6
5:	A03198	39.5	39.5	39.5	25.4	25.4	25.4	25.4
6:	A14752	.0	.0	.0	.0	.0	.0	.0
7:	A14752	.0	.0	.0	.0	.0	.0	.0
8:	A14752	36.7	36.7	36.7	24.3	24.3	24.3	34.3
9:	A14752	63.3	63.3	63.3	75.7	75.7	75.7	65.7
10:	A14752	.0	.0	.0	.0	.0	.0	.0
11:	A22496	4.9	6.0	1.6	3.7	3.7	3.7	3.7
12:	A22496	13.4	16.6	20.4	20.8	20.8	20.8	20.8
13:	A22496	80.0	75.9	68.9	64.5	64.5	64.5	64.5
14:	A22496	1.5	11.5	11.1	21.0	21.6	21.6	21.6
15:	A22496	.0	.0	.0	.0	.0	.0	.0
16:	A23770	.0	.0	.0	.0	.0	.0	.0
17:	A23770	.0	.0	.0	.0	.0	.0	.0
18:	A23770	.0	.0	.0	.0	.0	.0	.0
19:	A23770	.0	.0	.0	.0	.0	.0	.0
20:	A23770	.0	.0	.0	.0	.0	.0	.0
21:	A23828	.0	.0	.0	.0	.0	.0	.0
22:	A23828	10.0	10.0	10.0	10.0	10.0	10.0	10.0
23:	A23828	25.0	23.2	28.2	30.8	30.8	30.8	30.8
24:	A23828	10.1	18.0	16.4	17.6	17.6	17.6	17.6
25:	A23828	54.9	48.8	45.4	41.5	41.5	41.5	41.5
26:	A24044	.0	.0	.0	.0	.0	.0	.0
27:	A24044	.0	.0	.0	.0	.0	.0	.0
28:	A24044	20.0	20.0	20.0	.0	.0	.0	.0
29:	A24044	36.2	36.2	36.2	50.0	50.0	50.0	50.0
30:	A24044	43.8	43.8	43.8	50.0	50.0	50.0	50.0
31:	A24318	.0	.0	.0	.0	.0	.0	.0
32:	A24318	.0	.0	.0	.0	.0	.0	.0
33:	A24318	.0	.0	.0	.0	.0	.0	.0
34:	A24318	50.0	50.0	60.0	70.0	70.0	80.0	80.0
35:	A24318	50.0	50.0	40.0	30.0	30.0	20.0	20.0
36:	A24455	.0	.0	.0	.0	.0	.0	.0
37:	A24455	10.0	10.0	10.0	10.0	20.0	20.0	30.0
38:	A24455	30.0	30.0	30.0	40.0	40.0	40.0	50.0
39:	A24455	60.0	60.0	60.0	50.0	40.0	40.0	20.0
40:	A24455	.0	.0	.0	.0	.0	.0	.0
41:	A24463	.0	.0	.0	.0	.0	.0	.0
42:	A24463	.0	.0	.0	.0	.0	.0	.0
43:	A24463	40.5	35.4	39.7	45.7	44.9	44.9	44.9
44:	A24463	36.4	42.9	44.8	40.2	40.7	40.7	40.7
45:	A24463	23.1	21.7	15.5	14.2	14.3	14.3	14.3
46:	A24592	.0	.0	.0	.0	.0	.0	.0
47:	A24592	.0	.0	.0	.0	.0	.0	.0
48:	A24592	50.5	50.8	52.5	55.4	55.4	55.4	55.4
49:	A24592	42.7	42.9	41.6	44.3	44.3	44.3	44.3
50:	A24592	6.9	6.2	5.9	.3	.3	.3	.3
51:	A24763	.0	.0	.0	.0	.0	.0	.0
52:	A24763	.0	.0	.0	.0	.0	.0	.0
53:	A24763	100.0	100.0	100.0	100.0	100.0	100.0	100.0
54:	A24763	.0	.0	.0	.0	.0	.0	.0
55:	A24763	.0	.0	.0	.0	.0	.0	.0
56:	A24900	.0	.0	.0	.0	.0	.0	.0
57:	A24900	.0	.0	.0	.0	.0	.0	.0

Figure III.5.4

UNCLASSIFIED•••EAXMPLE OF QUANTITY/PROFILE DATA FROM UTILITY LEA/TAPE•••UNCLASSI

1:	A07198	44	44	44	48	48	48	48
2:	A14752	4	6	6	7	7	7	7
3:	A22496	5338	5809	3720	4823	4823	4823	4823
4:	A23770	0	0	0	0	0	0	0
5:	A23828	339	403	458	818	818	518	518
6:	A24044	33	13	13	19	19	15	15
7:	A24318	4	8	35	57	43	43	67
8:	A24455	431	798	916	1554	1280	1272	1272
9:	A24463	833	787	943	1134	1500	1500	1200
10:	A24592	44	48	83	87	57	57	57
11:	A24763	5	5	2	2	2	2	2
12:	A24900	854	653	744	789	993	9024	1035
13:	A27159	38	58	59	47	49	84	54
14:	A32444	3441	5153	2719	3843	3496	3722	3766
15:	A32508	540	534	893	677	677	677	677
16:	A32564	83	43	386	535	535	235	235
17:	A32568	3845	5267	2966	3779	3910	3834	3836
18:	A32570	530	440	699	954	924	924	924
19:	A34457	4	6	6	7	7	7	7
20:	A55293	311	148	198	543	543	243	243
21:	A55300	85	73	93	133	133	133	133
22:	A55304	4	4	6	6	6	6	6
23:	A55704	4	6	6	7	7	7	7
24:	A56235	8	8	5	4	6	6	6
25:	A56243	3344	4033	8491	7159	7510	7236	7257
26:	A56800	58	48	84	58	56	56	56
27:	A56937	83	48	75	98	86	86	86
28:	A58033	535	279	324	392	404	406	406
29:	A77877	84	84	84	94	84	84	84
30:	A78014	30	30	30	30	30	30	30
31:	A78151	508	523	233	249	280	250	250
32:	A80118	937	947	9386	1839	1945	1845	1842
33:	A80123	348	564	564	344	344	344	344
34:	A80344	0	0	0	0	0	0	0
35:	A80943	4	4	4	4	4	4	4
36:	B01756	48	87	33	951	151	121	121
37:	B07752	84	43	68	68	68	68	68
38:	B11795	37	955	184	134	194	194	194
39:	B13648	33	44	46	98	68	74	74
40:	B70238	8	35	15	12	12	12	12
41:	B70323	3	5	5	2	2	2	2
42:	B43063	377	514	522	310	327	330	330
43:	B51038	84	78	73	915	116	150	126
44:	B51039	53	49	80	99	88	91	91
45:	B63711	54	38	47	63	61	61	61
46:	B67423	314	116	116	150	150	120	120
47:	B67432	435	415	412	412	412	412	412
48:	B83582	8	8	8	8	8	8	8
49:	B83856	389	589	443	1510	1237	1288	1255
50:	B84404	480	760	3559	1781	1790	1793	1793
51:	C13491	3	37	39	39	39	39	39
52:	C20414	558	247	348	823	524	524	524
53:	C22058	3	7	34	14	14	14	14
54:	C22126	35	14	14	16	16	16	16
55:	C27811	54	58	32	32	32	32	32
56:	C27017	3	7	34	14	14	14	14
57:	C25757	50	52	37	304	107	107	107

Figure III.5.5

CHAPTER 6

UTILITY-ITMID/TEMP

6.1 DESCRIPTION: The purpose of this utility is to merge together data from the QUANTITY/PROFILES file and the DENSITY/PROFILES file created by the previous utility LEA/TAPE with the LINCODE/LIST file. The LINCODE/LIST file is created manually in the LINCODE/LIST element of the WARF program file of the current study, using as its source, data provided by the study's sponsor.

The utility reads in the LINCODE and the nomenclature from the LINCODE/LIST file and the corresponding 7-period quantities from the QUANTITY/PROFILE file and the first 7 time period density figures from the DENSITY/PROFILE file and immediately writes out this data onto the ITMID/TEMP file.

The utility does not check to ensure that the LINCODE on the LINCODE/LIST corresponds to the LINCODE on the QUANTITY/PROFILE and DENSITY/PROFILE files. Therefore, it assumes that all files are sorted on LINCODE and all files will have matching LINCODES.

6.2 STRUCTURE - The overall structure of this utility is displayed in Figure III.6.1.

6.3 DATA BASE - This utility uses a data base of three data files in order to produce the ITMID/TEMP file. The first two files, i.e., DENSITY/PROFILES and QUANTITY/PROFILES, are stored on mass storage devices and were produced by the previous utility, LEA/TAPE. The third file is manually produced either in punch card form or through the online system editor facility using the hard copy listing of list of LINCODES and their nomenclature being played in this study as supplied by the study's sponsor. In either case, by the time the file is read into the utility it will reside on mass storage.

The utility will produce one file as its output data base, the ITMID/TEMP file.

6.4 RUNSTREAM - The runstream for this utility can be found in file CSTART*82XQT under element name, ITMID/TEMP. Figure III.6.2 depicts the runstream. The runstream accomplishes the following functions:

- o Requires the user provide the appropriate password to gain access to the file SECRET*82WARFP88 where the data files and program files are stored.
- o Assigns the DENSITY/PROFILES, the QUANTITY/PROFILES and the LINCODE/LIST data files to logical units 9, 8, 7, respectively.

- o Executes the utility.
- o Copies the resulting data file from logical unit 3 to the permanent file ITMID/TEMP and writing out the first 18 lines of the data file for user review.
- o Releases units 3, 7, 8, 9 and 88 that were allocated for the utility.

6.5 INPUT - The utility will use these files stored on mass storage devices as input; DENSITY/PROFILE, QUANTITY/PROFILE and the LINCODE/LIST files. Figure III.6.3 gives the file layout and examples of the data for the DENSITY/PROFILES file. Figure III.6.4 does the same for the QUANTITY/PROFILES file and Figure III.6.5 for the LINCODE/LIST file.

FILE: DENSITY/PROFILES
STORAGE MEDIUM: Mass Storage
SOURCE: UTILITY LEA/TAPE

RECORD FORMAT:

Position	Description	Format
1	Blank	1X
2 - 7	Line Code	A6
8 - 18	Blanks	11X
19 - 53	Density Profiles for this line Item for Periods 1 - 7	(F5.1)

FILE: QUANTITY/PROFILES
STORAGE MEDIUM: Mass Storage
SOURCE: LEA/TAPE UTILITY

RECORD FORMAT:

Columns	Description	Format
1	Blank	1X
2 - 7	Line Code	A6
8 - 17	Blanks	19X
18 - 80	Quantity Profile for Periods 1 - 7	7(I9)

FILE: LINCODE/LIST
STORAGE MEDIUM: Mass Storage
SOURCE: Study Sponsor. Manually entered using list of LINCODES supplied by sponsor.

RECORD FORMAT:

Positions	Description	Format
1	Blank	1X
2 - 7	Line Code obtained from WARF data file	A6
8 - 9	Blanks	2X
10 - 39	Nomenclature (30 character name of item of Equipment obtained from WARF data	5A6

6.6 OUTPUT - This utility produces one output file; the ITMID/TEMP file on mass storage. This file is a multi-record file. The header or identification record identifies the item being described by its LINCODE and provides its nomenclature. The second record provides seven quantities occurrences for this item; one for each of the time periods in the exercise. The last record type will occur five times; once for each of the combat zones within the battlefield. Within each of these five records there will be seven occurences of the density distribution for this item within the particular combat zone for each of the seven time periods in the exercise. As in the DENSITY/PROFILE file which was its source, these densities within zones are percentages of the total equipment available for distribution during a time period. Therefore, the sumation over each of the five combat zones for each time period should equal 100%.

The following presents a record layout for the ITMID/TEMP file. Figure III.6.6 gives an example of the data as it can be found in the file.

FILE: ITMID/TEMP
STORAGE MEDIUM: Mass Storage
SOURCE: UTILITY ITMID/TEMP

RECORD FORMAT:

Position	Description	Format
1	Blank	1X
2 - 7	Lincode	A6
8	Blank	1X

9 - 39	Nomenclature	5(A6)
1 - 49	Quantity totals for this time Periods 1 - 7	7(I7)
1 - 35	Density Profile Percentage for this item for Time Period 1 for Zone 1 - 5	5(F5.2)
1 - 35	Density Profile Percentage for this item for Time Period 2 for Zone 1 - 5	5(F5.2)
1 - 35	Density Profile Percentage for this item for Time Period 3 for Zone 1 - 5	5(F5.2)
1 - 35	Density Profile Percentage for this item for Time Period 4 for Zone 1 - 5	5(F5.2)
1 - 35	Density Profile Percentage for this item for Time Period 5 for Zone 1 - 5	5(F5.2)
1 - 35	Density Profile Percentage for this item for Time Period 6 for Zone 1 - 5	5(F5.2)
1 - 35	Density Profile Percentage for this item for Time Period 7 for Zone 1 - 5	5(F5.2)

6.7 PERFORMANCE - The program resource requirements are as follows:

- o CORE: 20K or less
- o CPU TIME: 5 min or less
- o CLOCK TIME: 10 min or less
- o DISK UNITS: 4 each, space as assigned in runstream
- o COMMENTS: Debugging of data execution errors is accomplished by visual inspection

ITMID/TEMP PROGRAM FLOW

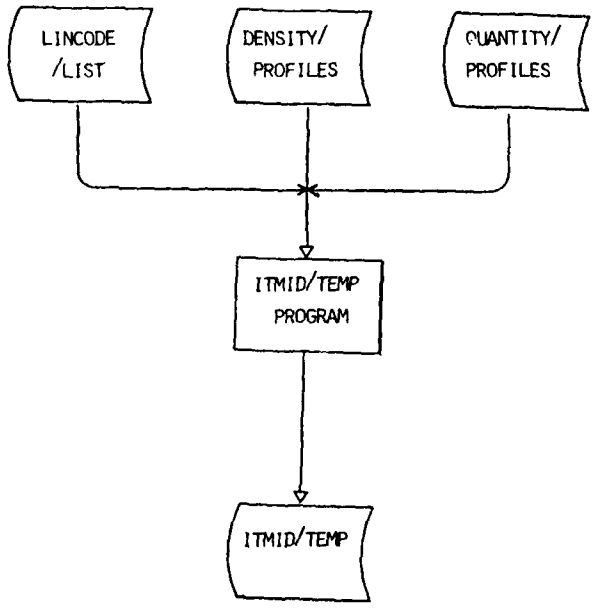


Figure III.6.1

```
UNCLASSIFIED***FILE NAME:CSTART*82XQT  ELEMENT NAME:ITMID/TEMP***UNCLASSIFIED

  1:@USE 88.,SECRET*82WARFP88.
  2:@ASG,A 88/    /   .
  3:@MSG,N  THE PROGRAM FILE ABOVE IS THE FILE USED TO STORE OUTPUT
  4:@MSG,N  FOR THE CURRENT STUDY (IN THIS CASE WARF P83).
  5:@ASG,T 9.,///500
  6:@ED   88.DENSITY/PROFILES*9.
  7:EXIT
  8:@MSG,N  THE ABOVE ELEMENT FILE CONTAINS THE DENSITY PROFILE FOR
  9:@MSG,N  EACH LIN CODE BEING CONSIDERED IN THE STUDY AND WAS
 10:@MSG,N  OBTAINED FROM THE UTILITY PROGRAM 82XQT.LEA/TAPE.
 11:@ASG,T 8.,///200
 12:@ED   88.QUANTITY/PROFILES*8.
 13:EXIT
 14:@MSG,N  THE ABOVE ELEMENT FILE CONTAINS THE QUANTITY PROFILE FOR
 15:@MSG,N  EACH LIN CODE BEING CONSIDERED IN THE STUDY AND WAS
 16:@MSG,N  OBTAINED FROM THE UTILITY PROGRAM 82XQT.LEA/TAPE.
 17:@ASG,T 7.,///200
 18:@ED   88.LINCODE/LIST*7.
 19:EXIT
 20:@MSG,N  THE ABOVE ELEMENT FILE WAS CREATED FROM THE LIST OF LIN CODES
 21:@MSG,N  FORWARDED BY THE STUDY SPONSOR AT THE BEGINNING OF THE
 22:@MSG,N  STUDY.  THE FILE CONTAINS LIN CODE AND NOMENCLATURE.
 23:@ASG,A 82XQT.
 24:@ASG,T 3.,///500
 25:@XQT 82XQT.ITMID/TEMP
 26:@ED   3.*88.ITMID/TEMP
 27:P 19
 28:EXIT
 29:@FREE 3.
 30:@FREE 7.
 31:@FREE 8.
 32:@FREE 9.
 33:@FREE 88.
```

Figure III.6.2

UNCLASSIFIED•••EXAMPLE DENSITY/PROFILE OUTPUT DATA FROM THE LEA/TAPE UTILITY•••U

1:	AD3198	.0	.0	.0	.0	.0	.0	.0
2:	AD3198	.0	.0	.0	.0	.0	.0	.0
3:	AD3198	.0	.0	.0	.0	.0	.0	.0
4:	AD3198	60.5	60.5	60.5	74.6	74.6	74.6	74.6
5:	AD3198	39.5	39.5	39.5	25.4	25.4	25.4	25.4
6:	A14752	.0	.0	.0	.0	.0	.0	.0
7:	A14752	.0	.0	.0	.0	.0	.0	.0
8:	A14752	36.7	36.7	36.7	24.3	24.3	24.3	34.3
9:	A14752	63.3	63.3	63.3	75.7	75.7	75.7	65.7
10:	A14752	.0	.0	.0	.0	.0	.0	.0
11:	A22496	4.9	6.0	1.6	3.7	3.7	3.7	3.7
12:	A22496	13.4	16.6	20.4	20.8	20.8	20.8	20.8
13:	A22496	80.0	75.9	66.9	64.5	64.5	64.5	64.5
14:	A22496	1.5	11.5	11.1	21.0	21.6	21.6	21.6
15:	A22496	.0	.0	.0	.0	.0	.0	.0
16:	A23770	.0	.0	.0	.0	.0	.0	.0
17:	A23770	.0	.0	.0	.0	.0	.0	.0
18:	A23770	.0	.0	.0	.0	.0	.0	.0
19:	A23770	.0	.0	.0	.0	.0	.0	.0
20:	A23770	.0	.0	.0	.0	.0	.0	.0
21:	A23828	.0	.0	.0	.0	.0	.0	.0
22:	A23828	10.0	10.0	10.0	10.0	10.0	10.0	10.0
23:	A23828	25.0	23.2	28.2	30.8	30.8	30.8	30.8
24:	A23828	10.1	18.0	16.4	17.6	17.6	17.6	17.6
25:	A23828	54.9	48.8	45.4	41.5	41.5	41.5	41.5
26:	A24044	.0	.0	.0	.0	.0	.0	.0
27:	A24044	.0	.0	.0	.0	.0	.0	.0
28:	A24044	20.0	20.0	20.0	.0	.0	.0	.0
29:	A24044	36.2	36.2	36.2	50.0	50.0	50.0	50.0
30:	A24044	43.8	43.8	43.8	50.0	50.0	50.0	50.0
31:	A24318	.0	.0	.0	.0	.0	.0	.0
32:	A24318	.0	.0	.0	.0	.0	.0	.0
33:	A24318	.0	.0	.0	.0	.0	.0	.0
34:	A24318	50.0	50.0	60.0	70.0	70.0	80.0	80.0
35:	A24318	50.0	50.0	40.0	30.0	30.0	20.0	20.0
36:	A24455	.0	.0	.0	.0	.0	.0	.0
37:	A24455	10.0	10.0	10.0	10.0	20.0	20.0	30.0
38:	A24455	30.0	30.0	30.0	40.0	40.0	40.0	50.0
39:	A24455	60.0	60.0	60.0	50.0	40.0	40.0	20.0
40:	A24455	.0	.0	.0	.0	.0	.0	.0
41:	A24463	.0	.0	.0	.0	.0	.0	.0
42:	A24463	.0	.0	.0	.0	.0	.0	.0
43:	A24463	40.5	36.4	39.7	45.7	44.9	44.9	44.9
44:	A24463	36.4	42.9	44.8	40.2	40.7	40.7	40.7
45:	A24463	23.1	21.7	15.5	14.2	14.3	14.3	14.3
46:	A24592	.0	.0	.0	.0	.0	.0	.0
47:	A24592	.0	.0	.0	.0	.0	.0	.0
48:	A24592	50.5	50.8	52.5	55.4	55.4	55.4	55.4
49:	A24592	42.7	42.9	41.6	44.3	44.3	44.3	44.3
50:	A24592	6.9	6.2	5.9	.3	.3	.3	.3
51:	A24763	.0	.0	.0	.0	.0	.0	.0
52:	A24763	.0	.0	.0	.0	.0	.0	.0
53:	A24763	100.0	100.0	100.0	100.0	100.0	100.0	100.0
54:	A24763	.0	.0	.0	.0	.0	.0	.0
55:	A24763	.0	.0	.0	.0	.0	.0	.0
56:	A24900	.0	.0	.0	.0	.0	.0	.0
57:	A24900	.0	.0	.0	.0	.0	.0	.0

Figure III.6.3

UNCLASSIFIED•••EXAMPLE OF THE QUANTITY/PROFILE DATA FROM UTILITY LEA/TAPE

1:	A07192	44	44	44	44	48	48	48	48
2:	A14752	4	4	6	6	7	7	7	7
3:	A22436	2338	2339	2809	3720	4823	4823	4823	4823
4:	A27770	0	0	0	0	0	0	0	0
5:	A23829	339	339	403	488	818	818	818	818
6:	A24044	10	10	13	13	13	18	18	18
7:	A24318	4	4	8	35	57	63	63	57
8:	A24455	431	431	788	916	1254	1290	1272	1272
9:	A24463	833	833	787	943	1184	1500	1500	1200
10:	A24532	44	44	48	83	87	57	57	57
11:	A24753	5	5	5	2	2	2	2	2
12:	A24900	554	554	653	744	989	993	3024	1035
13:	A27159	38	38	33	39	47	49	54	54
14:	A32444	3441	3441	3153	2718	3943	3408	3722	3766
15:	A32508	540	540	534	833	677	677	677	677
16:	A32564	24	32	43	998	535	535	235	235
17:	A32568	3845	3845	5267	2966	3773	3810	3834	3836
18:	A32570	530	530	440	809	954	924	924	924
19:	A34457	4	4	6	6	7	7	7	7
20:	A55233	311	311	148	198	543	543	243	243
21:	A55300	63	68	73	97	133	133	133	133
22:	A55304	4	4	4	6	6	6	6	6
23:	A55704	4	4	6	6	7	7	7	7
24:	A56235	8	8	8	5	4	6	6	6
25:	A56243	3344	3344	4033	8491	7158	7510	7236	7257
26:	A56800	58	58	48	84	56	58	56	56
27:	A56937	83	87	48	75	86	96	86	90
28:	A70032	535	535	279	324	792	404	405	406
29:	A77877	84	84	84	84	84	84	84	84
30:	A78014	30	30	30	30	30	30	30	30
31:	A78191	508	508	523	233	248	280	250	250
32:	A80118	837	837	947	9398	1933	1845	1845	1842
33:	A80127	348	348	564	564	344	344	344	344
34:	A80344	0	0	0	0	0	0	0	0
35:	A83543	4	4	4	4	4	4	4	4
36:	B01796	48	48	87	73	951	151	121	121
37:	B07752	84	84	43	68	68	58	68	68
38:	B11739	37	37	355	184	194	194	194	194
39:	B19648	33	33	44	40	83	68	74	74
40:	B20236	8	8	35	15	12	12	12	12
41:	B20523	3	3	5	5	2	2	2	2
42:	B43663	377	377	514	522	310	327	330	330
43:	B51038	84	84	79	73	915	116	156	128
44:	B51039	53	53	49	80	83	88	91	91
45:	B63711	54	54	38	47	63	61	61	61
46:	B67423	314	314	116	116	150	156	120	120
47:	B67432	415	415	415	412	412	412	412	412
48:	B67442	8	8	8	8	8	8	8	8
49:	B67456	383	339	559	443	1510	1237	1288	1255
50:	B74404	480	480	760	3553	1761	1790	1793	1793
51:	C19031	3	3	33	39	39	39	39	39
52:	C20414	233	233	247	348	923	524	524	524
53:	C20658	3	3	7	34	14	14	14	14
54:	C21126	12	13	14	14	16	16	16	16
55:	C23011	23	24	28	32	32	32	32	32
56:	C23017	3	3	7	34	14	14	14	14
57:	C25257	60	67	82	93	102	107	107	107

Figure III.6.4

UNCLASSIFIED•••EXAMPLE OF THE LINCODE/LIST DATA FILE•••UNCLASSIFIED

```
   1: AC3138   AK VEH M218 GM EQ P1A
   2: AI4752   ADAP TEST CAMERA LM178
   3: A23436   AIMING CIRCLE M2 W/C
   4: A23770   AIR COND EL/WNDW 6000B
   5: A23828   AIR COND E/WA 9000 BTU
   6: A24044   AIR COND 18000 BTU
   7: A24318   AIR COND 18000 BTU
   8: A24455   AIR COND EM AIR-COOL
   9: A24463   AIR COND E/WA 18000 BT
  10: A24532   AIR COND 18000 BTU
  11: A24763   AIR COND E/WA 36000 BTU
  12: A24800   AIR COND 36000 BTU
  13: A27159   AIR TRF C E AN/TSG-97
  14: A27444   ALARM CML ACT M11
  15: A27505   ALARM CML ACT M12
  16: A27564   ALARM CML ACT AUTO
  17: A27568   ALARM CML ACT AUTO
  18: A27570   ALARM CML ACT AUTO
  19: A27657   ALGMT FX MX-3409/AAS24
  20: A41666   RCR SET AN/TPQ-37 LP
  21: A55293   ANAL CHG E AN/ASM-177
  22: A55300   ANAL CHG E AN/ASM-490
  23: A55304   ANAL CHG E AN/CSM-201
  24: A55704   ANAL FLT LN AN/ASM-80
  25: A56235   ANAL SET LS-884
  26: A56243   ANAL SET ENC PTBL S S
  27: A56300   ANAL SPTCM AN/UPM-59
  28: A56337   ANAL SPTCM AN/UPM-84
  29: A56833   ANAL SPTCM TS-723/U
  30: A77877   ANTENNA GRP AN/GRA-4
  31: A78014   ANTENNA GRP AN/GRA-12
  32: A78151   ANTENNA GRP AN/GRA-50
  33: A78347   ATTENUTR VAR CN-1035/G
  34: B01756   AUCEC EARTH SM4A
  35: B11795   BOTTLE CLEANG AN/TAM-4
  36: B18648   BAKERY FLT M-1945LP
  37: B30238   BARGE ASSY SET 5X12
  38: B30323   BARGE DECK CGO NF 05
  39: B43663   BATH U FTBL SED LP
  40: B45597   BTRY CHGR PP7286 G/U
  41: B51098   BEACON SET AN/TRN-30V1
  42: B51099   BEACON SET AN/TRN-30V2
  43: B67711   BIN STG ACCR PTBL GD T
  44: B67427   BINOCULAR EL AN/PAS-5
  45: B67492   BINOCULAR INFRARED
  46: B83582   BOAT ORDG ERECT GD 27
  47: B83856   BOAT LAND INFLT 15 MAN
  48: B84404   BOAT RECON RNFU 3-MAN
  49: C18481   BREAKER PAV-DCTLL
  50: C20414   BRIDGE ARMD VEH
  51: C22058   BRIDGE ERECT SET FIX
  52: C22126   BRIDGE ERECT SET FB UK
  53: C23811   BRIDGE FXD HI-WAY ALUM
  54: C23817   BRIDGE FXD HI-WAY
  55: C25757   BRIDGE FLTG RAFT LT
  56: C25831   BRIDGE ERCG SET
  57: C36120   BLOZR EM E/M60 SER TKS
```

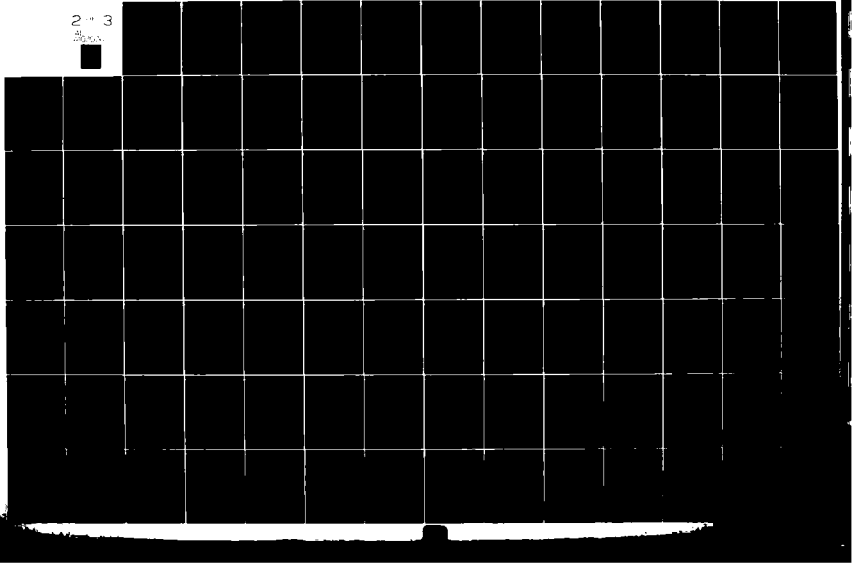
Figure III.6.5

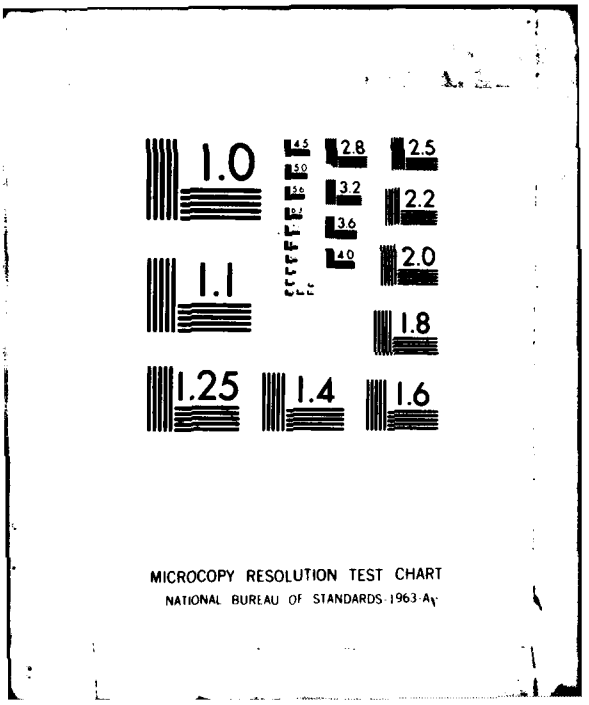
```
UNCLASSIFIED***EXAMPLE OF THE OUTPUT FROM UTILITY ITMID/TEMP***UNCLASSIFIED

  1: A07198 AK VFW M21P CM FQ F1A
  2:      54       64       44       58       78       88       98
  3:  .00  .00  .00  .80  .20
  4:  .00  .00  .00  .80  .20
  5:  .00  .00  .00  .80  .20
  6:  .00  .00  .00  .80  .20
  7:  .00  .00  .00  .80  .20
  8:  .00  .00  .00  .80  .20
  9:  .00  .00  .00  .75  .25
 10: A14752 ADAP TEST CAMERA LM178
 11:      10       16       16       17       17       17       17
 12:  .00  .00  .20  .80  .00
 13:  .00  .00  .20  .80  .00
 14:  .00  .00  .20  .80  .00
 15:  .00  .00  .15  .85  .00
 16:  .00  .00  .15  .85  .00
 17:  .00  .00  .35  .65  .00
 18:  .00  .00  .35  .65  .00
 19: A22496 AIMING CIRCLE M2 W/S
 20:    6615    6693    8820    8823    8823    8823    8978
 21:  .25  .25  .50  .00  .00
 22:  .25  .25  .50  .00  .00
 23:  .25  .25  .50  .00  .00
 24:  .25  .25  .50  .00  .00
 25:  .25  .25  .50  .00  .00
 26:  .25  .25  .50  .00  .00
 27:  .25  .25  .50  .00  .00
 28: A23770 AIR COND FL/WNDW 60008
 29:       0        0        0        0        0        0        0
 30:  .00  .00  .00  .00  .00
 31:  .00  .00  .00  .00  .00
 32:  .00  .00  .00  .00  .00
 33:  .00  .00  .00  .00  .00
 34:  .00  .00  .00  .00  .00
 35:  .00  .00  .00  .00  .00
 36:  .00  .00  .00  .00  .00
 37: A23629 AIR COND F/WA 9000 BTU
 38:     589      937      998      998      998      998      998
 39:  .00  .00  .25  .25  .50
 40:  .00  .00  .25  .25  .50
 41:  .00  .00  .25  .25  .50
 42:  .00  .00  .25  .25  .50
 43:  .00  .00  .25  .25  .50
 44:  .00  .00  .25  .25  .50
 45:  .00  .00  .25  .25  .50
 46: A24044 AIR COND 18000 BTU
 47:      53       53       53       55       55       55       55
 48:  .00  .00  .00  .50  .50
 49:  .00  .00  .00  .50  .50
 50:  .00  .00  .00  .50  .50
 51:  .00  .00  .00  .50  .50
 52:  .00  .00  .00  .70  .70
 53:  .00  .00  .00  .70  .70
 54:  .00  .00  .00  .70  .70
 55: A24410 AIR COND 24000 BTU
 56:      15       25       42       57       63       83       97
 57:  .00  .00  .25  .75  .00
```

Figure III.6.6

AD-A107 076 CACI INC-FEDERAL ARLINGTON VA F/G 15/7
WARTIME REQUIREMENTS FOR AMMUNITION MATERIEL AND PERSONNEL (WAR--ETC(U)
AUG 81 S CANTLON, H G RHOADES MDA903-80-D-0668
UNCLASSIFIED CAA-D-81-2 NL




1.0
1.1
1.25
1.4
1.6
2.8
3.2
3.6
4.0
2.5
2.2
2.0
1.8
MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS 1963-A

CHAPTER 7
UTILITY - ITMID/REC-A

7.1 DESCRIPTION: The purpose of this program is to merge data from the first produced ITMID/TEMP element with data from the aged ITMID/FINAL element which was produced and used in the previous study. The element should still be cataloged under the previous study's file. The result of this merging will be the ITMID/FINAL element of the current study.

The ITMID/FINAL element is composed of 3 record types and there will be seven occurrences of this record for each occurrence of the Master Record:

- o The first record type is the Master Record. It contains information which describes the line item as a whole such as its name, vulnerability class, and supply levels.
- o The second record type denotes the quantity of this item that will be available for each of the seven time periods being played in the study.
- o The third record type describes density profile of this item in each of five zones or areas of the battlefield.

This current program concentrates on the Master Record. To the new ITMID/FINAL element the program will copy all the data of the new ITMID/TEMP element and only columns 40-54 of the previous study's ITMID/FINAL element. If a new ITMID/TEMP Line Item cannot match an existing line item in the previous ITMID/FINAL, columns 40-54 are blank in the new ITMID/FINAL. The line item is written out to another element "MISSED/ITMID-CODES". WARF analysts using this, can then identify those items which need attention on the new ITMID/FINAL element and manually add in the required data.

If line items on the previous ITMID/FINAL have no corresponding items on the ITMID/TEMP, no records will be copied.

The program works using the following assumptions:

All elements are sorted in ascending order using LINCODE.

For each Master Record there will be one corresponding QUANTITY Record and 7 corresponding DENSITY/PROFILE Records.

7.2 STRUCTURE - Figure III.7.1 shows the overall structure of this utility.

7.3 DATA BASE - This utility uses a data base consisting of four data files; it creates two as input and two as output. As input the utility uses the ITMID/TEMP file created in the previous utility and ITMID/FINAL file which ws created during the previous running this utility for a previous study. As output the utility creates two mass storage files. The first output file is the ITMID/FINAL file for this current study. The other file produced; also

created on a mass storage device, is the MISSED/ITMID-CODES. This file details to the study's managers those items which are being played in the current study which were not played in the previous study.

7.4 RUNSTREAM - Figure III.7.2 shows the runstream which controls the execution of this utility. The utility performs the following functions.

- o Assigns the file SECRET*82WARFP88 to logical unit 88 and SECRET*82WARF86R to logical unit 86 and requires the user to provide the password for each file in order to gain access to the file.
- o Copies the contents of the previous studies ITMID/FINAL file to the logical unit 7 for processing.
- o Copies the contents of the ITMID/TEMP file created by the just completed ITMID/TEMP utility to logical unit 8 for processing.
- o Assigns logical units 2, and 3 to gather the outputs from the utility.
- o Executes the utility.
- o Copies the contents of logical unit 3 to the new ITMID/FINAL file and prints out 18 lines of the file contents for verification.
- o Copies the contents of logical unit 2 to the MISSED/ITMID-CODES file and prints out 10 lines for verification.
- o Releases all logical units used by the utility.

7.5 INPUT - The utility has two input files. One file is the ITMID/TEMP file that was produced by the previous utility ITMID/TEMP. The other file is the ITMID/FINAL file which was produced during the last study. This file should be cataloged as an element under the previous study's name.

Figures III.7.3 presents the record layouts and an example of data within the ITMID/TEMP file. Figures III.7.4 demonstrates the same for the ITMID/FINAL file which could be from the previous study.

FILE: ITMID/FINAL
STORAGE MEDIUM: Mass Storage
SOURCE: UTILITY - ITMID/RECA

RECORD FORMAT:

Position	Description	Format
1	Blank	1X
2 - 7	Line item number (LIN	A6
8	Blank	1X
9 - 38	Alphanumeric nomenclature	5(A6)
39	Blank	1X
40 - 41	Type equipment code for losses from theater model	I2
42 - 43	Vulnerability class for losses from artillery model	I2
44 - 45	Classification for Historical Data	I2
46 - 48	In-theater depot stockage (number of days supply)	I3
49 - 50	Fraction of intertheater shipment which is by air	F2.2
51 - 52	= 1 if actual equipment density is to be read and used = 0 if density is to be estimated from the number of divisions in theater	I2

53 - 54	= 1 if combat losses are from the theater simulation = 2 if combat losses are from artillery models = 3 if all losses are from history	I2
55 - 58	Sequence number	I4
1 - 49	Quantities of this line item for the seven time periods of the exercise, obtained from the new ITMID/TEMP file.	7(I7)
1 - 35	Density Profiles for Time Period N for this line item in each of the five zones or areas being played in this exercise. These density profiles are obtained from the new ITMID/TEMP file. There must be seven occurrences of this record; one for each time period being played.	(5F5.2)

7.6 OUTPUT - This utility produces one primary element as output and are secondary. The primary product is the ITMID/FINAL file. It details each item of equipment being played in the scenario, providing quantity and density statistics. The second product of this utility is the MISSED/ITMID-CODES elements. Entries in this element identify those items being played in this exercise which were not present in the previous study. As a result columns 40-54 of the ITMID/FINAL element will be blank. In order for the study to be completed these fields must be normally edited and correct data supplied.

Figures III.7.4 presents the record layouts and examples of data for the ITMID/FINAL file. Figure III.7.5 presents an example of MISSED/ITMID-CODES.

FILE: MISSED/ITMID-CODES
STORAGE MEDIUM: Mass Storage
SOURCE: UTILITY-ITMID/REC-A

RECORD FORMAT:

Position	Description	Format
1	Blank	1X
2 - 7	Line item number (LIN)	A6
8	Blank	1X
9 - 38	Alphanumeric nomenclature	5A6

7.7 PERFORMANCE - In order to execute the following resources are required:

- o CORE REQUIREMENTS 10K OR LESS
- o CPU TIME 10 MIN OR LESS
- o CLOCK TIME 15 MIN OR LESS
- o COMMENTS NONE

ITMID/REC-A STRUCTURE

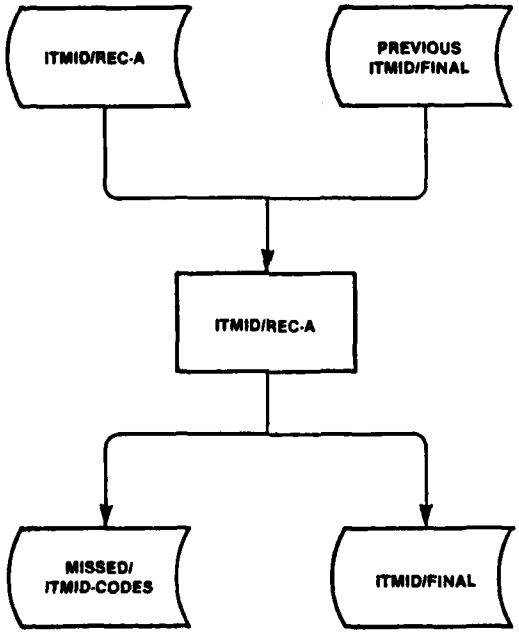


Figure III.7.1

```
UNCLASSIFIED***FILE NAME:CSTART*82XQT  ELEMENT NAME:ITMID/REC-A***UNCLASSIFIED

  1:@USE 88.,SECRET*82WARFP88.
  2:@ASG,A 88/    /   .
  3:@USE 86.,SECRET*82WARF86R.
  4:@ASG,A 86/    /   .
  5:@ASG,T 7.,///500
  6:@ED  86.ITMID/FINAL,7.
  7:EXIT
  8:@MSG,N  THE ABOVE ELEMENT FILE "ITMID/FILE" IS THE FINAL ITMID
  9:@MSG,N  USED IN THE PREVIOUS STUDY (IN THIS EXAMPLE P86).  THIS
 10:@MSG,N  FILE SERVES AS INPUT TO THIS UTILITY AND PROVIDES THE
 11:@MSG,N  THE PREVIOUSLY USED RECORD "A" DATA FOR EACH LIN CODE.
 12:@ASG,T 8.
 13:@ED  88.ITMID/TEMP,8.
 14:EXIT
 15:@MSG,N  THE ABOVE ELEMENT FILE "ITMID/TEMP" IS THE OUTPUT OF
 16:@MSG,N  UTILITY "82XQT.ITMID/TEMP" AND THE CURRENT STUDY'S ITMID DATA.
 17:@MSG,N  THIS DATA IS INPUT TO THIS UTILITY.
 18:@ASG,T 3.,///500
 19:@ASG,T 2.,///500
 20:@ASG,A 82XQT.
 21:@XQT 82XQT.ITMID/REC-A
 22:@ED  3.,88.ITMID/FINAL
 23:P 18
 24:LAST
 25:EXIT
 26:@MSG,N  THE ABOVE ELEMENT FILE "ITMID/FINAL" IS THE OUTPUT OF THIS
 27:@MSG,N  UTILITY AND EXCEPT FOR MANUAL EDITS THAT MAY BE REQUIRED
 28:@MSG,N  DUE TO CHANGES IN LIN CODES WILL BE THE FINAL ITMID FILE
 29:@MSG,N  FOR INPUT TO ELCON.
 30:@ED  2.,88.MISSED/ITMID-CODES
 31:P 10
 32:LAST
 33:EXIT
 34:@MSG,N  THE ABOVE ELEMENT FILE "MISSED/ITMID-CODES" PROVIDES A
 35:@MSG,N  LIST OF THOSE LIN CODES FOR WHICH A MATCH COULD NOT BE
 36:@MSG,N  FOUND BETWEEN THE PREVIOUS AND CURRENT STUDY.
 37:@FREE 2.
 38:@FREE 3.
 39:@FREE 7.
 40:@FREE 8.
 41:@FREE 86.
 42:@FREE 88.
```

Figure III.7.2

```
UNCLASSIFIED***EXAMPLE OF THE OUTPUT FROM UTILITY ITMID/TEMP***UNCLASSIFIED

  1: AD3198 AK VEH M218 GM EQ P1A
  2:      54       64       44       58       78       88       88
  3:   .00   .00   .00   .80   .20
  4:   .00   .00   .00   .80   .20
  5:   .00   .00   .00   .80   .20
  6:   .00   .00   .00   .80   .20
  7:   .00   .00   .00   .80   .20
  8:   .00   .00   .00   .80   .20
  9:   .00   .00   .00   .75   .25
 10: A14752 ADAP TEST CAMERA LM178
 11:      10       16       16       17       17       17       17
 12:   .00   .00   .20   .80   .00
 13:   .00   .00   .20   .80   .00
 14:   .00   .00   .20   .80   .00
 15:   .00   .00   .15   .85   .00
 16:   .00   .00   .15   .85   .00
 17:   .00   .00   .35   .65   .00
 18:   .00   .00   .35   .65   .00
 19: A22496 AIMING CIRCLE M2 W/E
 20:    6615    6699    8820    8823    8823    8823    8978
 21:   .25   .25   .50   .00   .00
 22:   .25   .25   .50   .00   .00
 23:   .25   .25   .50   .00   .00
 24:   .25   .25   .50   .00   .00
 25:   .25   .25   .50   .00   .00
 26:   .25   .25   .50   .00   .00
 27:   .25   .25   .50   .00   .00
 28: A23770 AIR COND FL/WNDW 60008
 29:       0        0        0        0        0        0        0
 30:   .00   .00   .00   .00   .00
 31:   .00   .00   .00   .00   .00
 32:   .00   .00   .00   .00   .00
 33:   .00   .00   .00   .00   .00
 34:   .00   .00   .00   .00   .00
 35:   .00   .00   .00   .00   .00
 36:   .00   .00   .00   .00   .00
 37: A23828 AIR COND F/WA 9000 BTU
 38:     889      993      998      998      998      998      998
 39:   .00   .00   .25   .25   .50
 40:   .00   .00   .25   .25   .50
 41:   .00   .00   .25   .25   .50
 42:   .00   .00   .25   .25   .50
 43:   .00   .00   .25   .25   .50
 44:   .00   .00   .25   .25   .50
 45:   .00   .00   .25   .25   .50
 46: A24044 AIR COND 18000 BTU
 47:      53       53       53       55       55       55       55
 48:   .00   .00   .00   .50   .50
 49:   .00   .00   .00   .50   .50
 50:   .00   .00   .00   .50   .50
 51:   .00   .00   .00   .50   .50
 52:   .00   .00   .00   .30   .70
 53:   .00   .00   .00   .30   .70
 54:   .00   .00   .00   .30   .70
 55: A24318 AIR COND 18000 BTU
 56:      15       25       42       57       63       83       97
 57:   .00   .00   .25   .75   .00
```

Figure III.7.3

```
UNCLASSIFIED***EXAMPLE OF THE OUTPUT OF UTILITY ITMID/REC-A***UNCLASSIFIED

  1: A03198 AK VEH M218 GM EQ P1A            0 522 30 0 1 2   1
  2:      54      64      44      58      78      88      88
  3:  .00   .00   .00   .80   .20
  4:  .00   .00   .00   .80   .20
  5:  .00   .00   .00   .80   .20
  6:  .00   .00   .00   .80   .20
  7:  .00   .00   .00   .80   .20
  8:  .00   .00   .00   .80   .20
  9:  .00   .00   .00   .75   .25
 10: A14752 ADAP TEST CAMERA LM178           01636 30 0 1 2   2
 11:      10      16      16      17      17      17      17
 12:  .00   .00   .20   .80   .00
 13:  .00   .00   .20   .80   .00
 14:  .00   .00   .20   .80   .00
 15:  .00   .00   .15   .85   .00
 16:  .00   .00   .15   .85   .00
 17:  .00   .00   .35   .65   .00
 18:  .00   .00   .35   .65   .00
 19: A22496 AIMING CIRCLE M2 W/E             01636 30 0 1 2   3
 20:    6615    6699    8820    8823    8823    8823    8978
 21:  .25   .25   .50   .00   .00
 22:  .25   .25   .50   .00   .00
 23:  .25   .25   .50   .00   .00
 24:  .25   .25   .50   .00   .00
 25:  .25   .25   .50   .00   .00
 26:  .25   .25   .50   .00   .00
 27:  .25   .25   .50   .00   .00
 28: A23770 AIR COND FL/WNDW 60008           01833 30 0 1 2   4
 29:       0       0       0       0       0       0       0
 30:  .00   .00   .00   .00   .00
 31:  .00   .00   .00   .00   .00
 32:  .00   .00   .00   .00   .00
 33:  .00   .00   .00   .00   .00
 34:  .00   .00   .00   .00   .00
 35:  .00   .00   .00   .00   .00
 36:  .00   .00   .00   .00   .00
 37: A23828 AIR COND F/WA 9000 BTU           01833 30 0 1 2   5
 38:     889     993     998     998     998     998     998
 39:  .00   .00   .25   .25   .50
 40:  .00   .00   .25   .25   .50
 41:  .00   .00   .25   .25   .50
 42:  .00   .00   .25   .25   .50
 43:  .00   .00   .25   .25   .50
 44:  .00   .00   .25   .25   .50
 45:  .00   .00   .25   .25   .50
 46: A24044 AIR COND 18000 BTU               01833 30 0 1 2   6
 47:      53      53      53      55      55      55      55
 48:  .00   .00   .00   .50   .50
 49:  .00   .00   .00   .50   .50
 50:  .00   .00   .00   .50   .50
 51:  .00   .00   .00   .50   .50
 52:  .00   .00   .00   .30   .70
 53:  .00   .00   .00   .30   .70
 54:  .00   .00   .00   .30   .70
 55: A24318 AIR COND 18000 BTU               01833 30 0 1 2   7
 56:      15      25      42      57      63      83      97
 57:  .00   .00   .25   .75   .00
```

Figure III.7.4

```
UNCLASSIFIED***EXAMPLE OF OUTPUT DATA MISSED/ITMID-CODES FROM UTILITY ITMID/TEMP

   1: A90118 ARMT SS HEL 7.62MM M23
   2: A90123 ARMT SS HEL 7.62MM M24
   3: A90344 ARMT SS HEL 7.62MM M41
   4: J88047 INSTL KIT ELEC EQ: MK15 2/GSG-
   5: L45016 LCHR RKT ACFT M158A1
   6: L45063 LCHR RKT ACFT M200A1
   7: L52040 LENS CONE A R LA-370A
   8: L52041 LENS CONE A R LA-371A
   9: L52042 LENS CONE A R LA-372A
  10: L91701 MG CAL.50 HVY FIXED
  11: L92260 MG 7.62MM ACFT LT
  12: L95939 MAINT A K MK-1192/ARM
  13: M11621 MASK CBR PROT ACFT M24
  14: Z00570 AERIAL RADIAC AN/ADR-6
  15: Z21489 DETECT SET AN/APR39V2
  16: Z43971 MICNS AIR DATA TML (RPV
  17: Z43999 MISSION PAYLOAD NIGHT ( PV)
  18: Z44712 MOUNT GM LCHR DRAGON
  19: Z50159 POSITION LOC RPT ABN U
  20: Z62820 AIR VEHICLE (RPV)
  21: Z66150 MISSION PAYLOAD DAYLIGH (RPV)
  22: Z93241 TRK CGO 10T MLRS RESUPP Y
```

Figure III.7.5

CHAPTER 8
UTILITY - TOE/ISTRUN

8.1 DESCRIPTION: The objective of this utility is to extract from the Table of Equipment (TOE) Master File obtained from FASTALS, authorized LINCODES and quantities by unit type and place them into the output file TOE/IST RUN. This function is accomplished by comparing the nine character Standard Requirements Codes (SRC) of the TOE Master File with the SRC's of the Arrayed Units files, which is generated by the study. When a match is detected, the appropriate information is extracted from the TOE Master File and written to the output file. The TOE master file is provided by the Support Forces Group. It is generated by matching a current total army troop list and TOE tapes obtained from USAMSAA.

The newly created TOE/lst RUN file will be used as input to the utility SCRUB/TOE.

8.2 STRUCTURE - The general structure for this utility is depicted in Figure III.8.1

8.3 DATA BASE - The utility uses four files as its data base; two as input and two as output. All four files are stored on mass storage devices and are elements under the general file SECRET*82WARFP88. The individual files themselves are discussed in more detail in following sections.

8.4 RUNSTREAM - Figure III.8.2 displays the runstream that is used to execute and control the running of this utility. The runstream is cataloged as an element called TOE/1st RUN under the file name: CSTART*82XQT. As it executes the runstream accomplishes the following functions.

- o Assigns the TOE Master File from FASTALS, in this example 82USTOEM, to the logical unit 8 for processing.
- o Assigns to logical unit 88 the general file SECRET*82WARFP88 (i.e., the file which contains the elements for the current study) and requires the user to supply the appropriate password to gain access.
- o Assigns to logical unit 7 the ARRAYED/UNITS file which was found under SECRET*82WARFP88.
- o Executes the utility.
- o Copies to permanent files the output files TOE/1stRUN and UNMATCHED/UNITS and prints out 20 lines of the TOE/1st RUN for verification.
- o Releases the allocated logical units used in the utility.

8.5 INPUT - As noted earlier this utility was two data sets as input file. The first file is the FASTALS TOE Master File which is obtained from the Support Forces Group, Forces Analyses Directorate, USACAA. The file is a copy of the FASTALS TOE data for the outyear of the current WARF study. The second input data set is the ARRAYED/UNITS file which is normally created manually using the system editor and data from the current study's program file. Both files are sorted in ascending order based upon the 9 character SRC code.

Figure III.8.3 depicts the record layout and sample data for the FASTALS TOE Master File. Figure III.8.4 depicts the record layout and sample data for the ARRAYED/UNITS file.

FILE: FASTAL TOE Master File
STORAGE MEDIUM: Mass Storage
SOURCE: FASTAL TOE MASTER FILE

RECORD FORMATS:

Position	Description	Format
1	Record Type = A(Header Record)	1A
2 - 10	Standard Requirements Code/TOE# (obtained from TOE Master File (FASTAL))	A9
1	Record Type - "B" (Detail Record)	1A
2 - 7	LINCODE	A6
8 - 11	Quantity Authorized for each line	I4

FILE: ARRAYED/UNITS

STORAGE MEDIUM: Mass Storage

SOURCE: Manually created using data supplied by the study team which describes the various unit types by SRC found in the stylized posture arrays.

RECORD FORMAT:

Position	Description	Format
1	Blank	1X
2 - 10	Standard Requirements Code (SRC)/TOE number)	A9
11 - 12	Blanks	2X

13 - 37	Nomenclature of Type Unit	A25
38 - 41	Type Unit Code Number (originated by WARF Analyst)	A4

8.6 OUTPUT - This utility produces two data sets as output. The first, UNMATCHED/UNITS, is simply a list of units for which an SRC match with the TOE Master File could not be made. The second file, TOE/1st RUN, is a compilation of all units for which an SRC match was made and the list of major items of equipment which is authorized for the unit. The file has two major record types.

The first record type of which there will be one for each unit, describes the unit with its SRC nomenclature, and Unit ID number. The second record type, of which there can be one or more, denotes each item of equipment, identified by its LINCODE, assigned to the unit and the quantity of the item authorized.

This file will be used as input to the following utility SCRUB/TOE.

Figure III.8.5 depicts the record layout for the UNMATCHED/UNITS file. Figure III.8.6 displays the record layout for the TOE/1st RUN file and present an example of the data that can be found in the file.

FILE: UNMATCHED/UNITS
STORAGE MEDIUM: Mass Storage
SOURCE: UTILITY - TOE/1st RUN

RECORD FORMAT:

Position	Description	Format
RECORD-1		
1 - 27	Character String	-
RECORD-2		
1 - 9	Source Requirement Code (SRC)	A9

FILE: TOE/1st RUN
STORAGE MEDIUM: Mass Storage
SOURCE: UTILITY - TOE/IST RUN

RECORD FORMATS:

Position	Description	Format
1 - 9	Standard Requirements Code	A9
10 - 14	Blanks	5X

15 - 39	Nomenclature of Unit Type	A25
40 - 45	Blanks	6X
46 - 49	Type Unit ID Number	A4
1 - 5	Blanks	5X
6 - 11	LINCODE	A6
12 - 13	Blanks	2X
14 - 17	Quantity of this line item	I4

8.7 PERFORMANCE - The execution of this utility requires the following resources:

CORE:	15K OR LESS
CPU TIME:	15 MIN OR LESS
CLOCK TIME:	20 MIN OR LESS
DISK UNITS:	1 - 2
COMMENTS:	NONE

TOE/1STRUN STRUCTURE

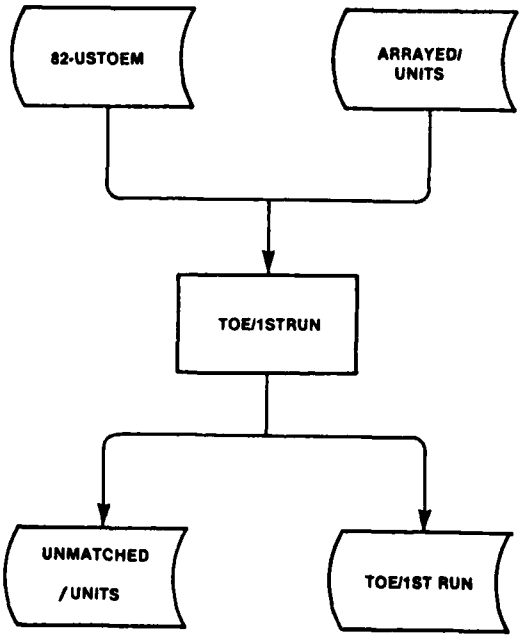


Figure III.8.1

```
UNCLASSIFIED***FILE NAME:CSTART.82XQT  ELEMENT NAME:TOE/1STRUN***UNCLASSIFIED

   1:@ASG,A 82USTOEM.
   2:@MSG,N  THE ABOVE DATA FILE WAS PREPARED FROM THE FASTALS MASTER
   3:@MSG,N  TOE DATA FILE, WHICH IS MAINTAINED BY SUPPORT FORCES
   4:@MSG,N  GROUP, FORCE ANALYSIS DIRECTORATE, USACAA.  THE FILE IS AN
   5:@MSG,N  EXACT DUPLICATE OF THE FASTALS TOE DATA FOR THE CUTYEAR
   6:@MSG,N  OF THE CURRENT WARF STUDY.
   7:@USE 8..82USTOEM.
   8:@USE 88.,SECRET.82WARFP88.
   9:@ASG,A 88/    /   .
  10:@ASG,T 7.
  11:@ED   86.ARRAYED/UNITS.7.
  12:EXIT
  13:@MSG,N  THE ABOVE ELEMENT FILE CONTAINS THE VARIOUS TYPE OF UNITS
  14:@MSG,N  BY SRC FOUND IN THE FOUR STYLIZED POSTURED ARRAYS PREPARED
  15:@MSG,N  BY THE STUDY TEAM FOR HIGH RESOLUTION GAMING.
  16:@ASG,T 9.
  17:@ASG,T 10.
  18:@XQT 82XQT.TOE/1STRUN
  19:@ED   9..88.TOE/1STRUN
  20:P 20
  21:LAST
  22:EXIT
  23:@MSG,N  THE ABOVE ELEMENT FILE "TOE/1STRUN" CONTAINS THE TOE'S
  24:@MSG,N  FOR THE VARIOUS TYPES OF UNITS FOUND IN THE FOUR STYLIZED
  25:@MSG,N  POSTURE ARRAYES.
  26:@ED   10..88.UNMATCHED/UNITS
  27:LNP!
  28:EXIT
  29:@MSG,N  THE ABOVE ELEMENT FILE "UNMATCHED/UNITS" WILL PROVIDE
  30:@MSG,N  A LISTING OF ALL UNITS FOR WHICH A SRC MATCH WITH THE
  31:@MSG,N  TOE MASTER FILE COULD NOT BE FOUND.
  32:@FREE 7.
  33:@FREE 8.
  34:@FREE 9.
  35:@FREE 10.
  36:@FREE 88.
```

Figure III.8.2

```
UNCLASSIFIED***EXAMPLE OF DATA FILE 82USTOEM (FASTALS MASTER TOE)***UNCLASSIFIED

 1:A01066900
 2:BA0321000001
 3:BA3094600002
 4:BA3206000002
 5:BA5529300001
 6:BA7226000002
 7:BA9011800004
 8:BB0712600001
 9:BB6776600002
10:BC5260100001
11:BC5301200001
12:BC8971900012
13:BC6885600004
14:BC8422700001
15:BC8477500001
16:BC8621300001
17:BC8914501101
18:BC8921301101
19:BD7948100001
20:BD8011600001
21:BD9053800001
22:BD9988800001
23:BD9902500001
24:BE0053300002
25:BE1083500001
26:BE2428100001
27:BE3308300001
28:BE4576600003
29:BE4582000005
30:BE5860100002
31:BE7006400001
32:BE7020100001
33:BE7081700001
34:BE8453100001
35:BG4456900001
36:BG8520200001
37:BH0230000001
38:BH8381700002
39:BJ4297600001
40:BJ4391800003
41:BJ4611000002
42:BJ4761700001
43:BJ4905500001
44:BJ4939800002
45:BJ5433000001
46:BK2381400001
47:BK2534200008
48:BK3104200002
49:BK3179500004
50:BK8724300001
51:BK8726900001
52:BK8727300001
53:BK9731900001
54:BK9325100001
55:BL0098400001
56:BL1053200004
57:BL4459500006
```

Figure III.8.3

UNCLASSIFIED•••EXAMPLE OF ARRAYED/UNITS DATA FILE•••UNCLASSIFIED

```
   1: 03087H700  NBC DEF CO                    CH01
   2: 05145H710  CBT ENG BN                    EN02
   3: 05146H700  HHC ENG BN                    EN03
   4: 05147H000  ENG CO                        EN04
   5: 05148H710  BRG CO                        EN05
   6: 06302H000  HHB DIVARTY                   FA06
   7: 06365H000  155MM SP BN                   FA07
   8: 06366H000  HHB 155MM BN                  FA08
   9: 06367H000  155MM BTRY                    FA09
  10: 06369H000  SVC BTRY 155MM                FA10
  11: 06395B110  8"/GSRS BN                    FA11
  12: 06396B110  HHB 8"/GSRS BN                FA12
  13: 06397B000  8"BTRY                        FA13
  14: 06393B100  GSRS BTRY                     FA14
  15: 06399B000  SVC BTRY 8"/GSRS              FA15
  16: 06445H100  8" SP BN(CORPS)               FA16
  17: 06446H100  HHB 8" BN(CORPS)              FA17
  18: 06447H100  8" BTRY(CORPS)                FA18
  19: 06449H100  SVC BTRY 8"(CORPS)            FA19
  20: 06515B000  GSRS BN(CORPS)                FA20
  21: 06516B000  HHB GSRS BN(CORPS)            FA21
  22: 06517B000  GSRS BTRY(CORPS)              FA22
  23: 07045H020  MECH INF BN                   ME23
  24: 07046H010  HHC MECH INF BN               ME24
  25: 07047H010  MECH INF CO                   ME25
  26: 07047H9X9  MECH INF PLT                  ME26
  27: 07049H020  CS CO INF                     ME27
  28: 08035H000  MED BN                        MD28
  29: 08036H000  HHC MED BN                    MD29
  30: 08037H000  MED CO                        MD30
  31: 08123H000  CBT SUPT HOSRITAL(CORPS)      MD31
  32: 09127H410  MED AMB CO(CORPS)             MD32
  33: 09137H200  MED AIR AMB CO(CORPS)         MD33
  34: 09038H300  ORD CO CONV AMMO(CORPS)       OR34
  35: 09047H400  SPEC AMMO DS CO(CORPS)        OR35
  36: 09048G800  SPEC AMMO DS/GS CO(CORPS)     OR36
  37: 09268H800  MNT BTRY HAWK(CORPS)          AD37
  38: 09557H510  MISSILE SUPT CO               AD38
  39: 10007H000  S&S CO                        QM39
  40: 10207H300  PETRL PL&TML OP CO(CORPS)     QM40
  41: 11035H000  SIGNAL BN                     SC41
  42: 11036H000  HHC SIG BN                    SC42
  43: 11037H000  CMD OPS CO                    SC43
  44: 11038H000  FWD COMM CO                   SC44
  45: 11039H000  SIG SUPT OP CO                SC45
  46: 12017H610  AG CO                         AG46
  47: 14037H610  FIN CO                        FC47
  48: 17004H000  HHC ARMD DIV                  AR48
  49: 17035H010  TANK 105MM BN                 AR49
  50: 17036H000  HHC TANK BN                   AR50
  51: 17037H010  TANK 105MM CO                 AR51
  52: 17037H9X9  TANK 105MM PLT                AR52
  53: 17039H000  CS CO TANK                    AR53
  54: 17042H000  HHC ARMD BDE                  CA54
  55: 17105H020  ARMD CAV SQDN                 CA55
  56: 17106H000  HHT CAV SQDN                  CA56
  57: 17108H000  AIR CAV TRP                   CA57
```

Figure III.8.4

```
UNCLASSIFIED***EXAMPLE OF OUTPUT FROM UTILITY TOE/1ST RUN

   1:REACHED END OF FILE ON END=95
   2:12255H700
```

Figure III.8.5

UNCLASSIFIED***EXAMPLE OF OUTPUT FROM UTILITY TOE/1STRUN***UNCLASSIFIED

1:	03087H700	N8C·DEF CO	CH01
2:	A32316	1	
3:	A32444	9	
4:	A32540	9	
5:	A72260	1	
6:	B49272	111	
7:	B67766	10	
8:	C52601	1	
9:	C53012	1	
10:	C53149	2	
11:	C89145	83	
12:	C89213	83	
13:	E00533	12	
14:	E45820	1	
15:	E70064	1	
16:	F81880	9	
17:	J43918	11	
18:	J46110	1	
19:	K87243	9	
20:	K87269	4	
21:	K87392	1	
22:	K87393	1	
23:	K87456	1	
24:	L44595	10	
25:	L63994	10	
26:	L92386	13	
27:	M11895	111	
28:	M75714	13	
29:	M80002	1	
30:	N54691	1	
31:	N96741	1	
32:	P43177	2	
33:	P95592	9	
34:	Q19339	18	
35:	Q19681	1	
36:	Q20935	38	
37:	Q21483	19	
38:	Q53001	4	
39:	Q54174	4	
40:	Q56783	6	
41:	Q78282	1	
42:	R73791	9	
43:	R94977	110	
44:	U01305	2	
45:	V15018	9	
46:	V31211	6	
47:	W32593	1	
48:	W32867	1	
49:	W33004	7	
50:	W51910	1	
51:	W95400	13	
52:	W95811	11	
53:	X39447	1	
54:	X40140	11	
55:	X40968	9	
56:	X58367	1	
57:	X60833	13	

Figure III.8.6

CHAPTER 9
UTILITY - SCRUB/TOE

9.1 DESCRIPTION - The purpose of this utility is to eliminate all major items of equipment from the TOE/1st RUN which are not being played in this study. The resulting file is referred to as the SCRUBBED/TOE. To accomplish this function the TOE/1STRUN utility was produced by the TOE/1STRUN utility and passed against the LINCODE/LIST file which was created manually earlier from the hard copy list of LINCODES provided by the study's sponsor. Only those items in the TOE/1STRUN file for which a match can be made in the LINCODE/LIST file will be copied into the SCRUBBED/TOE file and will continue in the study.

9.2 STRUCTURE - The general structure of this utility is depicted in Figure III.9.1.

9.3 DATA BASE - The utility uses three files in its data base, two as input, TOE/1st RUN and LINCODE/LIST, and one as output, SCRUBBED/TOE. All three files will be cataloged as elements under the study's general file, in this current example SECRET*82WARFP88. Each file is discussed in more detail in the following sections.

9.4 RUNSTREAM - Figure III.9.2 displays the runstream that is used to execute and control the utility. The runstream is cataloged as an element called SCRUB/TOE under the general file CSTART*82XQT. As it executes the utility accomplishes the following:

- o Assigns to logical unit 88 the general file for the current study. In this example, SECRET*82WARFP88 where it further requires the user to provide the password in order to gain access to the file.
- o Assigns the logical unit 3 to the file LINCODE/LIST.
- o Assigns the Logical Unit 2 to the file TOE/1st RUN.
- o Executes the utility.
- o Copies from the logical unit 7 to the file SCRUBBED/TOE under the current study's general file.
- o Releases the resources allocated to run the utility.

9.5 INPUT - The SCRUB/TOE uses two files as input data files. One file is the TOE/1ST RUN file which was created during the TOE/1st RUN utility which must be completed prior to the execution of this utility. This file identifies the units which are being analyzed under this current study. In addition, each unit contains detailed items of equipment which has been assigned to the unit and the respective quantities for each item. Figure III.9.3 presents the file layout and examples of the data found in the file.

FILE: TOE/IST RUN
STORAGE MEDIUM: Mass Storage
SOURCE: UTILITY - TOE/IST RUN

RECORD FORMATS:

Position	Description	Format
1 - 9	Standard Requirements Code	A9
10 -14	Blanks	5X
15 - 39	Nomenclature of Unit Type	A25
40 - 45	Blanks	6X
46 - 49	Type Unit ID Number	A4
1 - 5	Blanks	5X
6 - 11	LINCODE	A6
12 - 13	Blanks	2X
14 - 17	Quantity of this line item	I4

The second file used as input to this utility is the LINCODE/LIST file. This file is created manually using the hard copy list of LINCODES of the equipment items which are being analyzed in this study. This list of LINCODES is provided by the study's sponsor. Figure III.9.4 presents the record layout and examples of the data found in the file.

FILE: LINCODE/LIST
STORAGE MEDIUM: Mass Storage
SOURCE: Manually created by study personnel. Contains the complete list of line codes being considered by the current study.

RECORD FORMAT:

Position	Description	Format
1	Blank	1X
2 - 7	LINE CODE	A6

9.6 OUTPUT - This utility produces one file as output, the SCRUBBED/TOE file. It is cataloged under the current studies general file, in the current example SECRET*82WARFP86. This file uses the same record layout as the TOE/1st RUN input file to this utility. Further, while this new file contains all the units as the input file, it has eliminated from it all items of equipment which are not being analyzed in this study. If the item is not in the LINCODE/LIST file, it will not be in the resulting SCRUB/TOE file.

Figure III.9.5 depicts the record layout for the file and an example of the data that can be found in it. Once again the record layouts for the SCRUB/TOE and TOE/1st RUN are identical.

FILE: SCRUBBED/TOE
STORAGE MEDIUM: Mass Storage
SOURCE: UTILITY - SCRUB/TOE

RECORD FORMATS:

Position	Description	Format
1 - 9	Standard Requirements Code	A9
10 - 14	Blanks	5X
15 - 45	Nomenclature of Unit Type	A31
46 - 49	Type Unit ID Number	A4
1 - 5	Blanks	5X
6 - 11	LINCODE	A6
12 - 13	Blanks	2X
14 - 17	Quantity of this Line Item	I4

9.7 PERFORMANCE - The execution of this utility requires the following resources:

CORE:	10K OR LESS
CPU TIME:	10 MIN OR LESS
CLOCK TIME:	15 MIN or LESS
DISK UNITS:	1 - 2
COMMENTS:	NONE

SCRUB/TOE STRUCTURE

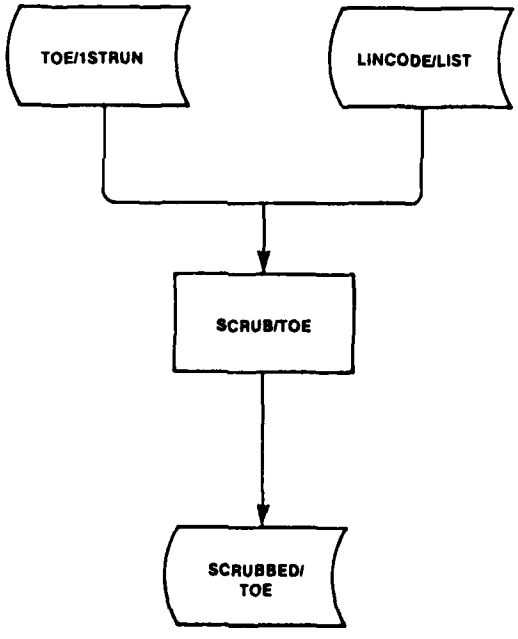


Figure III.9.1

```
UNCLASSIFIED***FILE NAME:CSTART*82XQT  ELEMENT NAME:*CRUB/TOE***UNCLASSIFIED

 1:@USE 88.,SECRET*82WARFP88.
 2:@ASG,A 88/    /   .
 3:@ASG,T 3.
 4:@ED   88.LINCODE/LIST,3.
 5:EXIT
 6:@MSG,N  THE ABOVE ELEMENT FILE "LINCODE/LIST" CONTAINS A
 7:@MSG,N  COMPLETE LIST OF THE LIN CODES BEING CONSIDERED BY THE
 8:@MSG,N  CURRENT STUDY.
 9:@ASG,T 2.
10:@ED   88.TOE/1STRUN,2.
11:EXIT
12:@MSG,N  THE ABOVE ELEMENT FILE "TOE/1STRUN" CONTAINS THE OUTPUT
13:@MSG,N  OF THE UTILITY "82XQT.TOE/1STRUN".
14:@ASG,T 7.
15:@ASG,A 82XQT.
16:@XQT 82XQT.SCRUB/TOE
17:@ED   7.,88.SCRUBBED/TOE
18:P 20
19:LAST
20:EXIT
21:@MSG,N  THE ABOVE ELEMENT FILE "SCRUBBED/TOE" CONTAINS THE OUT-
22:@MSG,N  PUT OF THIS UTILITY, WHICH ONLY INCLUDES THE TOE AUTHERIZATIONS
23:@MSG,N  FOR THOSE LIN CODES BEING CONSIDERED BY THIS WARF STUDY.
24:@FREE 2.
25:@FREE 3.
26:@FREE 7.
27:@FREE 88.
```

Figure III.9.2

```
UNCLASSIFIED***EXAMPLE OF OUTPUT FROM UTILITY TOE/1STRUN***UNCLASSIFIED

  1:03087H700      N8C DEF CO                        CH01
  2:       A32316      1
  3:       A32444      9
  4:       A32540      9
  5:       A72260      1
  6:       B49272    111
  7:       B67766     10
  8:       C52601      1
  9:       C53012      1
 10:       C53149      2
 11:       C89145     83
 12:       C89213     83
 13:       E00533     12
 14:       E45820      1
 15:       E70064      1
 16:       F81880      9
 17:       J43918     11
 18:       J46110      1
 19:       K87243      9
 20:       K87269      4
 21:       K87392      1
 22:       K87393      1
 23:       K87456      1
 24:       L44595     10
 25:       L63994     10
 26:       L92386     13
 27:       M11895    111
 28:       M75714     13
 29:       M80002      1
 30:       N54691      1
 31:       N96741      1
 32:       P43177      2
 33:       P95592      9
 34:       Q19339     18
 35:       Q19681      1
 36:       Q20935     38
 37:       Q21483     19
 39:       Q53001      4
 39:       Q54174      4
 40:       Q56783      6
 41:       Q78282      1
 42:       R73791      9
 43:       R94977    110
 44:       U01305      2
 45:       V15018      9
 46:       V31211      6
 47:       W32593      1
 48:       W32867      1
 49:       W33004      7
 50:       W51910      1
 51:       W95400     13
 52:       W95811     11
 53:       X39447      1
 54:       X40146     11
 55:       X40968      9
 56:       X58367      1
 57:       X60833     13
```

Figure III.9.3

UNCLASSIFIED***EXAMPLE OF THE LINCODE/LIST DATA FILE***UNCLASSIFIED

```
   1: AD3198   AK VEH M218 GM EQ P1A
   2: A14752   ADAP TEST CAMERA LM178
   3: A22496   AIMING CIRCLE M2 W/E
   4: A23770   AIR COND FL/WNDW 60008
   5: A23328   AIR COND F/WA 9000 BTU
   6: A24044   AIR COND 13000 BTU
   7: A24318   AIR COND 18000 BTU
   8: A24455   AIR COND FM AIR-COOL
   9: A24463   AIR COND F/WA 18000 BT
  10: A24592   AIR COND 19000 BTU
  11: A24763   AIR COND F/WA 360008 TUU
  12: A24900   AIR COND 36000 BTU
  13: A27159   AIR TRF C F AN/TSQ-97
  14: A32444   ALARM CML AGT M11
  15: A32508   ALARM CML AGT M12
  16: A32564   ALARM CML AGT AUTO
  17: A32568   ALARM CML AGT AUTO
  18: A32570   ALARM CML AGT AUTO
  19: A34457   ALGMT FX MX-8409/AAS24
  20: A41666   RDR SET AN/TPQ-37 LP
  21: A55293   ANAL CHC B AN/ASM-137
  22: A55300   ANAL CHG B AN/ASM-490
  23: A55304   ANAL CHG B AN/CSM-261
  24: A55704   ANAL FLT LN AN/ASM-80
  25: A56235   ANAL SET LS-89A
  26: A56243   ANAL SET ENG PTBL S S
  27: A56800   ANAL SPTCM AN/UPM-58
  28: A56937   ANAL SPTCM AN/UPM-84
  29: A58033   ANAL SPTCM TS-723/U
  30: A77877   ANTENNA GRP AN/GRA-4
  31: A78014   ANTENNA GRP AN/GRA-12
  32: A78151   ANTENNA GRP AN/GRA-50
  33: A99943   ATTENUTR VAR CN-1035/G
  34: B01756   AUGER EARTH SM4A
  35: B11795   BOTTLE CLEANG AN/TAM-4
  36: B18640   BAKERY PLT M-1945LP
  37: B30238   BARGE ASSY SET 5X12
  38: B30923   BARGE DECK CGO NP OC
  39: B43663   BATH U PTBL GED LP
  40: B45597   BTRY CHGR PP7286% G/U
  41: B51098   BEACON SET AN/TRN-30V1
  42: B51099   BEACON SET AN/TRN-30V2
  43: B63711   BIN STG AGGR PTBL 60 T
  44: B67423   BINOCULAR EL AN/PAS-5
  45: B67492   BINOCULAR INFRARED
  46: B83582   BOAT BRDG ERECT GD 27
  47: B83856   BOAT LAND INFLT 15 MAN
  48: B84404   BOAT RECON PNEU 3-MAN
  49: C18481   BREAKER PAV-DRILL
  50: C20414   BRIDGE ARMD VEH
  51: C22058   BRIDGE ERECT SET FIX
  52: C22120   BRIDGE ERECT SET FB UK
  53: C22911   BRIDGE FXD HI-WAY ALUM
  54: C23017   BRIDGE FXD HI-WAY
  55: C25757   BRIDGE FLTG RAFT LT
  56: C26031   BRIDGE EREC SET
  57: C36120   BLDZR EM F/M60 SER TKS
```

Figure III.9.4

```
UNCLASSIFIED***EXAMPLE OF OUTPUT OF UTILITY SCRUB/TOE**UNCLASSIFIED

 1:03087H700      NBC DEF CO                          CH01
 2:       A32444      9
 3:       E00533     12
 4:       E45820      1
 5:       E70064      1
 6:       F81680      9
 7:       J43918     11
 8:       J46110      1
 9:       L44595     10
10:       M75714     13
11:       N96741      1
12:       P43177      2
13:       P95592      9
14:       Q19339     18
15:       Q20935     38
16:       Q21483     19
17:       Q53001      4
18:       Q54174      4
19:       Q56783      6
20:       Q78232      1
21:       R94977    110
22:       U01305      2
23:       V15018      9
24:       V31211      6
25:       W32593      1
26:       W95400     13
27:       W95811     11
28:       X39447      1
29:       X40146     11
30:       X40968      9
31:       X58367      1
32:       X60833     13
33:       X63299      1
34:05145H710      CBT ENG BN                          EN02
35:       A32444     10
36:       B83582      2
37:       B83856     18
38:       B84404     27
39:       C20414      6
40:       C25757      2
41:       C85494      3
42:       C86213      1
43:       D11538      3
44:       D12087     40
45:       E00533     24
46:       E45820      8
47:       E56578      8
48:       E69242      1
49:       E70064      5
50:       E70886      1
51:       E73626      2
52:       F39378      3
53:       F81980      1
54:       G02204     48
55:       G02341     50
56:       H02300      2
57:       H38787      2
```

Figure III.9.5

CHAPTER 10

UTILITY - TOE/ADD-PLTS

10.1 DESCRIPTION - The purpose of this utility is to identify those units in the SCRUBBED/TOE file which are in fact platoon size units rather than company size units and correspondingly divide the quantity issued the unit for each authorized item of equipment by 3. (This factor can be varied if needed).

A second file is also used as input to this utility. This file contains those units which have been flagged as platoon size units. Using this file the utility is able to identify those platoon size units in the SCRUBBED/TOE file, make the necessary adjustments in the quantities of equipment authorized, if necessary and write to the output file (FINAL/TOE) the unit identification and the equipment description and quantity data. The study manager is responsible for the creating of the PLATOONS file. This FINAL/TOE file is the sole output of this utility and is used as input to the following RAM/MATRIX utility.

10.2 STRUCTURE - Figure III.10.1 depicts the general structure of this utility.

10.3 DATA BASE - The data base which is used by this utility consists of two input files and one output file. The input files are the SCRUBBED/TOE file which was produced by the earlier SCRUB/TOE utility, and the PLATOONS file which is manually produced by the study manager using the system editor. The output file FINAL/TOE uses the same record layout as the SCRUBBED/TOE file; however, the quantity data for equipment for those units which have been flagged as being platoon size units has been scaled down by a factor of three.

All files which make up the data base reside on mass storage devices and are cataloged as elements under the current study's general file; in the current example, this file would be SECRET*82WARFP88.

10.4 RUNSTREAM - The runstream which is used the execute and control this utility is displayed in Figure III.10.2. The runstream is cataloged as an element under file CSTART*82XQT using element name TOE/ADD-PLTS. As the utility executes it accomplishes the following functions:

- o Assigns to the logical unit 88 the study's general file SECRET*82WARFP88 and requires the user to supply the proper password to gain access to the file.
- o Assigns to logical unit 7 the PLATOONS file.
- o Assigns to logical unit 8 the SCRUBBED/TOE file.
- o Executes the utility.

- o Copies the output file from logical unit 9 to the permanent file FINAL/TOE under the current study's general file.

- o Releases the logical units allocated for the execution of this utility.

10.5 INPUT - The TOE/ADD-PLTS utility uses two data files as its input. One file is the SCRUBBED/TOE which was created as a result of the SCRUB/TOE utility. The second file is the PLATOONS file which is manually created using the system online editor. Both files are cataloged under the study's general file; in this instance SECRET*82WARFP88.

The SCRUBBED/TOE file is a collection of all the units participating in the study accompanied by a detailed list of all items of equipment assigned the unit and the quantity of the item authorized. The file uses two record formats. The first record format is used to dscribe the particular unit and occurs once per unit. It contains such data as the units Standard Requirement Code, nomenclature of the type of unit, and the type unit ID number. The second record type is used to describe the items of equipment assigned to the unit. This record type will occur as many times per unit (i.e., first record type) as there are items of equipment assigned to the unit and being played in the study. This record consists of two fields. The first field identifies the item of equipment using its LINCODE. The second field denotes the number of individual units of this item that are authorized for this unit. Record layouts and examples of the data in the file can be seen in Figure III.10.3

FILE: SCRUBBED/TOE
STORAGE MEDIUM: Mass Storage
SOURCE: UTILITY - SCRUB/TOE

RECORD FORMAT:

Position	Description	Format
1 - 9	Standard Requirements Code	A9
10 - 14	Blanks	5X
15 - 45	Nomenclature of Unit Type	A31
46 - 49	Type Unit ID Number	A4
1 - 5	Blanks	5X
6 - 11	LINCODE	A6
12 - 13	Blanks	2X
14 - 17	Quantity of this Line Item	I4

The PLATOONS file contains data which identifies parent units of company size and its corresponding platoon size unit. This file consists of one record type which describes the unit by its Standard Requirement Code, unit nomenclature and unit ID. The utility assumes the records will be organized in the file so that each parent unit record (company) will be followed immediately by one and only one sub-unit (PLATOON) record. The record layout and examples of data within the file can be seen in Figure III.10.4.

FILE: PLATOONS
STORAGE MEDIUM: Mass Storage
SOURCE: Manually created by study participants.

RECORD FORMAT:

Position	Description	Format
1	Blank	1X
2 - 10	Standard Requirement Code	A9
11- 12	Blanks	2X
13 - 37	Nomenclature	A25
38 - 41	Identification sequence number of unit	A4

10.6 OUTPUT - This utility produces one output file, ITMID/FINAL. The file element is cataloged under the study's general file, in this case SECRET*82WARFP88. This file contains, in addition to all the data on the company size units, that was found on the SCRUBBED/TOE file; i.e., unit identification data and equipment identification data and authorized quantities, information on platoons which are subordinate to selected parent units. These parent units and subordinate units were identified by the study manager and transmitted to the utility through the PLATOONS input file. The file will have the same file format structure as the SCRUBBED/TOE input file in that it will have two record types. The first record type will describe the particular unit or subunit and will occur once per unit. The second record will describe the items of equipment assigned the unit and the quantity of each item authorized. This record type will occur once for each item of equipment assigned the unit. Figure III.10.5 presents the file layout for the file and examples of the data that can be found in it.

FILE: FINAL/TOE
STORAGE MEDIUM: Mass Storage
SOURCE: UTILITY - TOE/ADD-PLTS

RECORD FORMAT:

Position	Description	Format
1 - 9	Special Requirement Code	A9
10 - 14	Blanks	5X
15 - 45	Nomenclature	A31
46 - 49	Type Unit ID Number	A4
1 - 5	Blanks	5X
6 - 11	LINCODE	A6
12 - 13	Blanks	2X
14 - 17	Quantity	I4

10.7 PERFORMANCE - This utility will require the following resources:

CORE:	10K OR LESS
CPU TIME:	10 MIN OR LESS
CLOCK TIME:	15 MIN OR LESS
DISK UNITS:	1 - 2
COMMENTS:	NONE

TOE/ADD-PLTS STRUCTURE

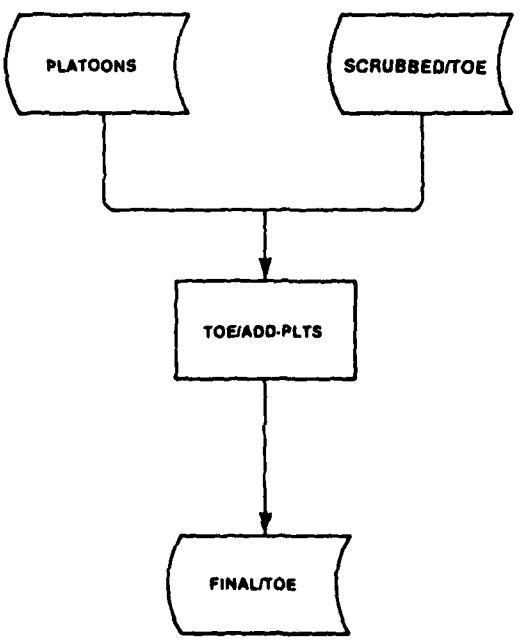


Figure III.10.1

```
UNCLASSIFIED***FILE NAME:CSTART*82XQT  ELEMENT NAME:TOE/ADD-PLTS***UNCLASSIFIED

 1:@USE 88.,SECRET*82WARFP88.
 2:@ASG,A 88/    /   .
 3:@ASG,T 7.
 4:@ED   88.PLATOONS,7.
 5:EXIT
 6:@MSG,N  THE ABOVE ELEMENT FILE "PLATOONS" CONTAINS THE
 7:@MSG,N  PARENT UNIT(COMPANY) AND SUBUNIT(PLATOON) DATA BY SRC FOR
 8:@MSG,N  INPUT TO THIS UTILITY.
 9:@ASG,T 8.
10:@ED   88.SCRUBBED/TOE,8.
11:EXIT
12:@MSG,N  THE ABOVE ELEMENT FILE "SCRUBBED/TOE" CONTAINS THE
13:@MSG,N  OUTPUT OF THE UTILITY "82XQT.SCRUB/TOE", WHICH
14:@MSG,N  REFLECTS ONLY THE AUTHERIZED QUANTITIES FOR THOSE
15:@MSG,N  LIN CODES BEING CONSIDERED BY THE CURRENT WARF STUDY.
16:@ASG,T 9.
17:@ASG,A 82XQT.
18:@XQT 82XQT.TOE/ADD-PLTS
19:@ED   9.,88.FINAL/TOE
20:P 20
21:LAST
22:EXIT
23:@MSG,N  THE ABOVE ELEMENT FILE "FINAL/TOE" IS THE OUTPUT OF
24:@MSG,N  THIS UTILITY.  THIS FILE WILL REQUIRE ADDITIONAL REVIEW
25:@MSG,N  AND EDITTING BEFORE IT CAN BE USE AS INPUT TO THE
26:@MSG,N  UTILITY "82XQT.RAM/MATRIX".
27:@FREE 7.
28:@FREE 8.
29:@FREE 9.
30:@FREE 88.
```

Figure III.10.2

UNCLASSIFIED***EXAMPLE OF OUTPUT OF UTILITY SCRUB/TOE**UNCLASSIFIED

```
 1:030087H700      NBC DEF CO                    CHO1
 2:      A32444      9
 3:      E00533     12
 4:      E45820      1
 5:      E70064      1
 6:      F81880      9
 7:      J43918     11
 8:      J46110      1
 9:      L44595     10
10:      M75714     13
11:      N96741      1
12:      P43177      2
13:      P95592      9
14:      Q19339     18
15:      Q20935     38
16:      Q21483     19
17:      Q53001      4
18:      Q54174      4
19:      G56783      6
20:      Q78232      1
21:      R94977    110
22:      U01305      2
23:      V15018      9
24:      V31211      6
25:      W32593      1
26:      W95400     13
27:      W95811     11
28:      X39447      1
29:      X40146     11
30:      X40968      9
31:      X58367      1
32:      XE0833     13
33:      X63299      1
34:051145H710      CBT ENG BN                    ENO2
35:      A32444     10
36:      B83582      2
37:      B83856     18
38:      B84404     27
39:      C20414      6
40:      C25757      2
41:      C85494      3
42:      C86213      1
43:      D11538      3
44:      D12087     40
45:      E00533     24
46:      E45820      8
47:      E56578      8
48:      E69242      1
49:      E70064      5
50:      E70886      1
51:      E73626      2
52:      F39378      3
53:      F81880      1
54:      G02204     48
55:      G02341     50
56:      H02300      2
57:      H38787      2
```

Figure III.10.3

```
UNCLASSIFIED***EXAMPLE OF INPUT DATA FILE PLATOONS***UNCLASSIFIED

  1: 07047H010  MECH INF CO              ME25
  2: 07047H9X9  MECH INF PLT             ME26
  3: 17037H010  TANK 105MM CO            AR51
  4: 17037H9X9  TANK 105MM PLT           AR52
  5: 17307H700  ARMD CAV TRP             CA58
  6: 17307H9X9  ARMD CAV PLT             CA59
  7: 44267H500  HAWK BRTY                AD74
  8: 44267H9X9  HAWK PLT                 AD75
  9: 44327H000  ADA BRTY VULCAN          AD78
 10: 44327H9X9  ADA PLT VULCAN           AD79
 11: 44323H000  ADA BTRY CHAPARRAL       AD80
 12: 44328H9X9  ADA PLT CHAPARRAL        AD81
```

Figure III.10.4

UNCLASSIFIED***EXAMPLE OF OUTPUT OF UTILITY TOE/AJU-PLTS**UNCLASSIFIED

```
 1:03087H700        NBC DEF CO                    CH01
 2:         A32444    9
 3:         E00533   12
 4:         E45820    1
 5:         E70064    1
 6:         F81080    9
 7:         J43918   11
 8:         J46110    1
 9:         L44595   10
10:         N75714   13
11:         N96741    1
12:         P43177    2
13:         P95592    9
14:         Q19339   18
15:         R20935   38
16:         R21483   19
17:         R53001    4
18:         R54174    4
19:         R56783    6
20:         R78282    1
21:         R94977  110
22:         U01305    2
23:         V15018    9
24:         V31211    6
25:         W32593    1
26:         W95400   13
27:         W95811   11
28:         X39447    1
29:         X40146   11
30:         X40768    9
31:         X58367    1
32:         X60833   13
33:         X63299    1
34:05145H710        CBT ENG BN                    EN02
35:         A32444   10
36:         B83582    2
37:         B83856   18
38:         B84404   27
39:         C20414    6
40:         C25757    2
41:         C35494    3
42:         C86713    1
43:         D11538    3
44:         D12067   40
45:         E00533   24
46:         E45820    8
47:         E56578    8
48:         E69242    1
49:         E70064    5
50:         E70886    1
51:         E73826    2
52:         F37378    1
53:         F81080    1
54:         G02204   48
55:         G02341   50
56:         H02300    2
57:         H38787    2
```

Figure III.10.5

CHAPTER 11

UTILITY - RAM/MATRIX
OR
WIMP/MATRIX

11.1 DESCRIPTION - The purpose of this utility is to process and merge data from three files and develop the RAM/MATRIX. The RAM/MATRIX is a two dimensional array. The Y axis of the array is the units in the study identified by their two character unit codes and sequence number. The X axis of the matrix consists of 22 columns; one for each of the 22 vulnerability categories into which an item of equipment will be classified. (Figure III.11.3). These categories are used to group together items of equipment which have common susceptibilities to indirect fire. The title of this utility will be changed to WIMP/MATRIX when used with the WARF Intermediate Materiel Processor.

The interior of the matrix accumulates for each unit in the study the number of items of equipment the unit is authorized in each of the vulnerability categories.

This RAM/MATRIX data file of unit type and item vulnerability category is used as input to other modules such as the Target Acquisition Model (TAM) output files, the TOTAL/CATEGORY utility and the TOTAL/UNITS utility.

11.2 STRUCTURE - The overall structure of this utility is depicted in Figure III.1.1.

11.3 DATA BASE - The data base which is used by this utility consists of four files; three used as input and one as output. All files are cataloged as elements under the current study's general file; in this case SECRET-*82WARFP88. The first input file, ARRAYED/UNITS is prepared by the study manager and contains the various types of units and their nomenclature that are being included in the study's high resolution arrays. This file is also used as input to another utility, TOE/1st RUN. The second input file to this utility is ITMID/FINAL file for the current study which was produced by the ITMID/REC-A utility.

Out of this file the utility extracts the vulnerability category assigned each item of equipment. The final input file used by this utility is the FINAL/TOE which was produced by the TOTAL/ADD-PLTS utility. The utility takes from this file the number of authorized quantities of equipment for each unit and accumulates these quantities on vulnerability code.

The RAM/MATRIX file is the only output file produced by the RAM/-MATRIX utility. The file summarizes or accumulates by unit type/vul-

nerability code the number of items of equipment which have been authorized for this unit.

11.4 RUNSTREAM - the runstream which is used to control the execution of this utility is depicted in Figure III.11.2. The runstream is cataloged as an element under the general file CSTART*82XQT using the element name RAM/MATRIX. The utility accomplishes the following as it executes:

- o Assigns to logical unit 88 the study's general file, in this example SECRET*82WARFP88, and requires the user to supply the appropriate file password to gain access to it prior to using the runstream.
- o Assigns logical unit 7 to the ARRAYED/UNITS file, logical unit 8 to the ITMID/FILE file; and logical unit 9 to the FINAL/TOE file.
- o Executes the utility.
- o Copies the output file to the permanent file RAM/MATRIX and catalogs is under the current study's general file.
- o Releases the units allocated to execute the utility.

11.5 INPUT - This utility uses three data files as its input. One file is the ARRAYED/UNITS file which was prepared manually by the study manager. The second file is the ITMID/FINAL file which was produced bythe ITMID/REC-A utility. The final input file is the FINAL/TOE file which was produced by the TOE/ADD-PLTS utility.

From these files the utility extracts data on:

- o The type units participating in the study Stylized Arrays (ARRAYED UNITS)
- o Items of equipment being used in the study and their artillery vulnerability category (ITMID/FINAL).
- o The authorized allocations of items of equipment to units (FINAL/-TOE).

Using this data the utility is able to produce the RAM/MATRIX.

Figure III.11.4 depicts the example data for the ARRAYED/UNITS file; Figure III.11.5 presents the example data for the ITMID/FINAL file; and Figure III.11.6 presents the file example data for the FINAL/TOE file.

FILE: ARRAYED/UNITS
STORAGE MEDIUM: Mass Storage
SOURCE: Manually created using data supplied by the study team which describes the various unit types by SRC found in the stylized posture arrays.

RECORD FORMAT:

Position	Description	Format
1	Blank	1X
2 - 10	Standard Requirements Code (SRC)/ TOE number	A9
11 - 12	Blanks	2X
13 - 37	Nomenclature of Type Unit	A25
38 - 41	Type Unit Number	A4

FILE: ITMID/FINAL
STORAGE MEDIUM: Mass Storage
SOURCE: UTILITY - ITMID/RECA

RECORD FORMAT:

Position	Description	Format
1	Blank	1X
2 - 7	Line item number (LIN	A6
8	Blank	1X
9 - 38	Alphanumeric nomenclature	5(A6)
39	Blank	1X
40 - 41	Type equipment code for losses	I2
42 - 43	Vulnerability class for losses from artillery model	I2
44 - 45	Classification for Historical Data	I2
46 - 48	In-theater depot stockage (number of days supply)	I3
49 - 50	Fraction of intheater shipment which is by air	F2.2
51 - 52	= 1 if actual equipment density is to be read and used	I2

	= 0 if density is to be estimated from the number of divisions in theater	
53 - 54	= 1 if combat losses are from the theater simulation = 2 if combat losses are from artillery models = 3 if all losses are from history	I2
55 - 58	Sequence number	I4
1 - 49	Quantities of this line item for the seven time periods of the exercise, obtained from the new ITMID/TEMP file.	7(I7)
1 - 35	Density Profiles for Time Period N for this line item in each of the five zones or areas being played in this exercise. These density profiles are obtained from the new ITMID/TEMP file. There must be seven occurrences of this record; one for each time period being played.	5F(F5.2)

FILE: FINAL/TOE

STORAGE MEDIUM: Mass Storage

SOURCE: UTILITY - TOE/ADD-PLTS

RECORD FORMATS:

Positions	Description	Format
1 - 9	Special Requirement Code	A9
10 - 14	Blanks	5X
15 - 45	Nomenclature	A3
46 - 49	Type Unit ID Number	A4
1 - 5	Blanks	5X
6 - 11	LINCODE	A6

12 - 13	Blanks	2X
14 - 17	Quantity	I4

11.6 OUTPUT - The RAM/MATRIX file is the only output from the RAM/-MATRIX utility. This file has one record type consisting of the unit identification code and the 22 occurrences of the artillery vulnerability categories. As the utility executes it examines for each unit type each individual item of equipment which it has been authorized and determines the equipment's artillery vulnerability category and the quantity of this equipment this unit has been authorized and accumulates in the vulnerability category for this unit the quantity of items authorized. It should be noted that emphasis in this process is on unit type and number of equipment units in specific vulnerability categories, regardless of the specific type of equipment.

FILE: RAM/MATRIX (WIMP/MATRIX)
STORAGE MEDIUM: Mass Storage
SOURCE: Utility - RAM/MATRIX (WIMP/MATRIX)

RECORD FORMAT:

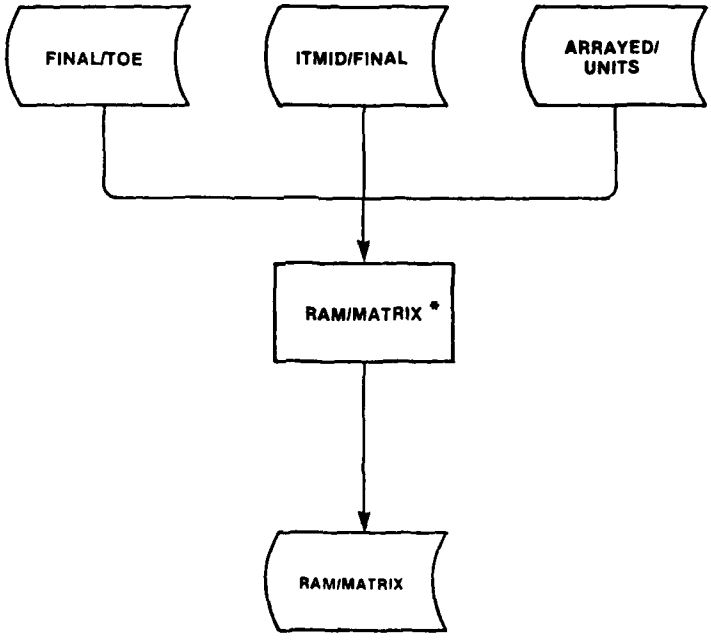
Position	Description	Format
1	Blank	1X
2 - 3	First 2 characters of the Unit Type Code	A2
4 - 5	Subscript of the above Code	I2
6 - 93	Accumulated Quantities for Lincodes and their corresponding Vulnerability Categories.	22I4

Figure III.11.7 presents the file layout and examples of the data found in the file.

11.7 PERFORMANCE - This utility will require the following resources:

CORE:	10K OR LESS
CPU TIME:	10 MIN OR LESS
CLOCK TIME:	10 MIN OR LESS
DISK UNITS:	1 - 2
COMMENTS:	NONE

RAM/MATRIX STRUCTURE



* The WIMP/MATRIX program may be named in lieu of RAM/MATRIX

Figure III.11.1

```
UNCLASSIFIED***FILE NAME:CSTART*82XQT  ELEMENT NAME:RAM/MATRIX***UNCLASSIFIED

   1:@USE 88.*SECRET*82WARFP88.
   2:@ASG*A 88/    /   .
   3:@ASG*T 7.
   4:@ED  88.ARRAYED/UNITS*7.
   5:EXIT
   6:@MSG*N  THE ABOVE ELEMENT FILE "ARRAYED/UNITS" IS CONTAINS INPUT DATA TO
   7:@MSG*N  THIS UTILITY ON THE UNIT ARRAY CODES.
   8:@ASG*T 8.*///500
   9:@ED  88.ITMID/FINAL*8.
  10:EXIT
  11:@MSG*N  THE ABOVE ELEMENT FILE "ITMID/FINAL" IS THE FINAL ITMID
  12:@MSG*N  FILE FOR THE CURRENT STUDY.  IT WILL PROVIDE DATA TO
  13:@MSG*N  THIS UTILITY ON THE ARTILLERY VULNERABILITY CATEGORIES
  14:@MSG*N  FOR EACH LIN CODE.
  15:@ASG*T 9.*///500
  16:@ED  88.FINAL/TOE*9.
  17:EXIT
  18:@MSG*N  THE ABOVE ELEMENT FILE "FINAL/TOE" IS THE FINAL TOE FOR THE
  19:@MSG*N  VARIOUS TYPES OF UNITS FOUND IN THE FOUR STYLIZED ARRAYES.
  20:@MSG*N  THIS FILE WILL PROVIDE INPUT DATA ON THE AUTHERIZED
  21:@MSG*N  QUANTITIES OF EQUIPMENT (LIN CODES) BY TYPE OF UNIT.
  22:@ASG*T 10.*///500
  23:@ASG*A 32XQT.
  24:@XQT 82XQT.RAM/MATRIX
  25:@ED  10.*88.RAM/MATRIX
  26:LNP!
  27:EXIT
  28:@MSG*N  THE ABOVE ELEMENT FILE "RAM/MATRIX" CONTAINS THE OUTPUT
  29:@MSG*N  DATA PRODUCED BY THIS UTILITY.  THIS DATA WILL SERVE AS INPUT
  30:@MSG*N  TO THE TAM DATA FILE* WHICH IS AN INPUT FILE TO RAM.
  31:@FREE 7.
  32:@FREE 8.
  33:@FREE 9.
  34:@FREE 10.
  35:@FREE 88.
```

Figure III.11.2

ARTILLERY (and TACAIR) VULNERABILITY CATEGORIES

Vulnerability Category	Title	Notional Item
1	Light aircraft	Helicopter, light observation
2	Light armor	Carrier, armored personnel
3	Medium/heavy armor	Combat tanks
4	Light vehicles	Truck, 1/4 ton
5	Medium/heavy self-propelled vehicles	Truck, 2 1/2 ton
6	Light boats (floating	Bridge erection boats
7	Light towed equipment	Trailer, cargo, 1/4 ton
8	Towed artillery	Howitzer, towed; 105mm
9	Medium/heavy towed	Semitrailer, 12 ton
10	Medium Recovery Veh	M88A1
11	Light Recovery Veh	M578
12	Ammunition transporters	Carrier, cargo, 6 ton
13	POL transporters	Truch, tank, fuel servicing
14	Small arms	Rifle, .5.56mm
15	Crew-served weapons	Machinegun, 7.62mm
16	Optical and illumination instruments	Night vision sights
17	Communications/electronic devices	Radio, portable
18	Machines	Generator set, 05-10KG
19	Miscellaneous small equipment	Antenna, RC-292
20	Medium/large shop sets	Shops equipment, auto maintenance
21	POL storage equipment	Fuel system, supply point, 6,000 gallons
22	Water tanks	Tank, fabric, 1,500 gallon

Figure III.11.3

UNCLASSIFIED•••EXAMPLE OF ARRAYED/UNITS DATA FILE•••UNCLASSIFIED

```
  1: 03087H700  NBC DEF CO                      CH01
  2: 05145H710  CBT ENG BN                      END2
  3: 05146H700  HHC ENG BN                      END3
  4: 05147H000  ENG CO                          END4
  5: 05148H710  BRG CO                          END5
  6: 06302H000  HHB DIVARTY                     FA06
  7: 06365H000  155MM SP BN                     FA07
  8: 06366H000  HHB 155MM BN                    FA08
  9: 06367H000  155MM BTRY                      FA09
 10: 06363H000  SVC BTRY 155MM                  FA10
 11: 06395B110  8"/GSRS BN                      FA11
 12: 06396B110  HHB 8"/GSRS BN                  FA12
 13: 06397B000  8"BTRY                          FA13
 14: 06398100   GSRS BTRY                       FA14
 15: 06398B000  SVC BTRY 8"/GSRS                FA15
 16: 06445H100  8" SP BN(COPPS)                 FA16
 17: 06446H100  HHB 8" BN(CORPS)                FA17
 18: 06447H100  8" BTRY(CORPS)                  FA18
 19: 06449H100  SVC BTRY 8"(CORPS)              FA19
 20: 06515B000  GSRS BN(CORPS)                  FA20
 21: 06516B000  HHB GSRS BN(CORPS)              FA21
 22: 06517B000  GSRS BTRY(CORPS)                FA22
 23: 07045H020  MECH INF BN                     ME23
 24: 07046H010  HHC MECH INF BN                 ME24
 25: 07047H010  MECH INF CO                     ME25
 26: 07047H9X9  MECH INF PLT                    ME26
 27: 07048H020  CS CO INF                       ME27
 28: 08035H000  MED BN                          MD28
 29: 08036H000  HHC MED BN                      MD29
 30: 08037H000  MED CO                          MD30
 31: 08123H000  CBT SUPT HOSRITAL(CORPS)        MD31
 32: 08127H410  MED AMB CO(CORPS)               MD32
 33: 08137H200  MED AIR AMB CO(CORPS)           MD33
 34: 09038H300  ORD CO CONV AMMO(CORPS)         OR34
 35: 09047H400  SPEC AMMO DS CO(CORPS)          OR35
 36: 09048C800  SPEC AMMO DS/GS CO(CORPS)       OR36
 37: 09268H800  MNT BTRY HAWK(CORPS)            AD37
 38: 09557H510  MISSILE SUPT CO                 AD38
 39: 10007H000  S&S CO                          QM39
 40: 10207H300  PETRL PL&TML OP CO(CORPS)       QM40
 41: 11035H000  SIGNAL BN                       SC41
 42: 11036H000  HHC SIG BN                      SC42
 43: 11037H000  CMD OPS CO                      SC43
 44: 11038H000  FWD COMM CO                     SC44
 45: 11039H000  SIG SUPT OP CO                  SC45
 46: 12017H610  AG CO                           AG46
 47: 14037H610  FIN CO                          FC47
 48: 17004H000  HHC ARMD DIV                    AR48
 49: 17035H010  TANK 105MM BN                   AR49
 50: 17036H000  HHC TANK BN                     AR50
 51: 17037H010  TANK 105MM CO                   AR51
 52: 17037H9X9  TANK 105MM PLT                  AR52
 53: 17039H000  CS CO TANK                      AR53
 54: 17042H000  HHC ARMD BDE                    CA54
 55: 17105H020  ARMD CAV SQDN                   CA55
 56: 17106H000  HHT CAV SQDN                    CA56
 57: 17108H000  AIR CAV TRP                     CA57
```

Figure III.11.4

```
UNCLASSIFIED***EXAMPLE OF THE OUTPUT OF UTILITY ITMID/REC-A***UNCLASSIFIED

  1: A03198 AK VEH M218 GM EG P1A            0 522 30 0 1 2   1
  2:      54      64      44      58      78      88      88
  3:  .00   .00   .00   .80   .20
  4:  .00   .00   .00   .80   .20
  5:  .00   .00   .00   .80   .20
  6:  .00   .00   .00   .80   .20
  7:  .00   .00   .00   .80   .20
  8:  .00   .00   .00   .80   .20
  9:  .00   .00   .00   .75   .25
 10: A14752 ADAP TEST CAMERA LM178           01636 30 0 1 2   2
 11:      10      16      16      17      17      17      17
 12:  .00   .00   .20   .80   .00
 13:  .00   .00   .20   .80   .00
 14:  .00   .00   .20   .80   .00
 15:  .00   .00   .15   .85   .00
 16:  .00   .00   .15   .85   .00
 17:  .00   .00   .35   .65   .00
 18:  .00   .00   .35   .65   .00
 19: A22496 AIMING CIRCLE M2 W/E             01636 30 0 1 2   3
 20:   6615    6699    9820    8923    8823    8823    8978
 21:  .25   .25   .50   .00   .00
 22:  .25   .25   .50   .00   .00
 23:  .25   .25   .50   .00   .00
 24:  .25   .25   .50   .00   .00
 25:  .25   .25   .50   .00   .00
 26:  .25   .25   .50   .00   .00
 27:  .25   .25   .50   .00   .00
 28: A23770 AIR COND FL/WNDW 60008           01833 30 0 1 2   4
 29:       0       0       0       0       0       0       0
 30:  .00   .00   .00   .00   .00
 31:  .00   .00   .00   .00   .00
 32:  .00   .00   .00   .00   .00
 33:  .00   .00   .00   .00   .00
 34:  .00   .00   .00   .00   .00
 35:  .00   .00   .00   .00   .00
 36:  .00   .00   .00   .00   .00
 37: A23828 AIR COND F/WA 9000 BTU           01833 30 0 1 2   5
 38:    889     993     998     998     998     998     998
 39:  .00   .00   .25   .25   .50
 40:  .00   .00   .25   .25   .50
 41:  .00   .00   .25   .25   .50
 42:  .00   .00   .25   .25   .50
 43:  .00   .00   .25   .25   .50
 44:  .00   .00   .25   .25   .50
 45:  .00   .00   .25   .25   .50
 46: A24044 AIR COND 18000 BTU               01833 30 0 1 2   6
 47:      53      53      53      55      55      55      55
 48:  .00   .00   .00   .50   .50
 49:  .00   .00   .00   .50   .50
 50:  .00   .00   .00   .50   .50
 51:  .00   .00   .00   .50   .50
 52:  .00   .00   .00   .30   .70
 53:  .00   .00   .00   .30   .70
 54:  .00   .00   .00   .30   .70
 55: A24318 AIR COND 18000 BTU               01833 30 0 1 2   7
 56:      15      25      42      57      63      83      97
 57:  .00   .00   .25   .75   .00
```

Figure III.11.5

UNCLASSIFIED***EXAMPLE OF OUTPUT OF UTILITY TOE/ADD-PLTS**UNCLASSIFIED

```
 1:030870700      NBC DEF CO                              CH01
 2:       A32444      9
 3:       B00533     12
 4:       B45820      1
 5:       B70064      1
 6:       F81380      9
 7:       J43418     11
 8:       J46110      1
 9:       L44595     10
10:       M75714     13
11:       N96741      1
12:       P43177      2
13:       P95392      9
14:       Q19339     18
15:       Q20935     38
16:       Q21483     19
17:       R53001      4
18:       R54174      4
19:       R56783      6
20:       R78282      1
21:       R94977    110
22:       U01305      2
23:       V15018      9
24:       V31211      6
25:       W32593      1
26:       W95400     13
27:       W95811     11
28:       X39447      1
29:       X40146     11
30:       X40968      9
31:       X58367      1
32:       X60833     13
33:       X63299      1
34:051450710       CBT ENG BN                              EN02
35:       A32444     10
36:       B83582      2
37:       B83856     18
38:       B84404     27
39:       C20414      6
40:       C25757      2
41:       C85494      3
42:       C86213      1
43:       D11538      3
44:       D14087     40
45:       E00533     24
46:       E45820      8
47:       E56578      8
48:       E69242      1
49:       E70064      5
50:       E70886      1
51:       E73626      2
52:       F37378      3
53:       F81080      1
54:       G02204     48
55:       G02341     50
56:       H02300      2
57:       H33767      2
```

Figure III.11.6

UNCLASSIFIED•••EXAMPLE OF THE OUTPUT DATA OF UTILITY RAM/MATRIX•••UNCLASSIFIED

1:	CH01	0	0	0	23	22	0	24	0	0	0	0	0	0	121	13	87	24	73	1	0	0	9
2:	EN02	0	0	4	55	88	0	86	0	20	10	0	0	4	1142	79	315	271	101	147	26	0	15
3:	EN03	0	0	0	24	32	0	24	0	7	2	0	0	4	202	9	55	71	43	11	7	0	15
4:	EN04	0	0	0	5	9	0	12	0	2	2	0	0	0	194	15	51	36	9	30	4	0	0
5:	EN05	0	0	4	11	20	0	14	0	5	0	0	0	0	160	6	56	56	22	16	3	0	0
6:	FA06	0	0	0	35	14	0	17	0	2	0	0	0	0	215	10	53	131	37	25	1	0	0
7:	FA07	0	19	0	43	39	0	24	0	5	0	2	54	2	645	74	136	356	78	118	3	0	0
8:	FA08	0	0	0	29	3	0	13	0	1	0	0	0	0	240	17	51	234	43	73	2	0	0
9:	FA09	0	6	0	3	6	0	2	0	1	0	0	15	0	108	17	22	34	8	13	0	0	0
10:	FA10	0	0	0	5	18	0	5	0	1	0	2	9	2	81	6	19	20	11	6	1	0	0
11:	FA11	0	19	0	59	54	0	37	0	21	1	2	48	0	767	82	170	416	115	106	7	0	0
12:	FA12	0	1	0	34	4	0	15	0	1	0	0	0	0	234	20	61	224	53	58	1	0	0
13:	FA13	0	4	0	4	8	0	3	0	1	0	0	12	0	105	14	21	37	8	10	1	0	0
14:	FA14	0	6	0	7	3	0	4	0	1	0	0	0	0	94	11	26	53	25	11	1	0	0
15:	FA15	0	0	0	6	23	0	9	0	16	1	2	12	0	134	9	20	23	13	7	2	0	0
16:	FA16	0	12	0	42	42	0	28	0	5	1	2	42	0	544	57	123	210	53	64	1	0	0
17:	FA17	0	0	0	27	3	0	16	0	1	0	0	0	0	145	11	41	93	19	21	0	0	0
18:	FA18	0	4	0	3	7	0	2	0	1	0	0	11	0	104	13	22	32	8	12	0	0	0
19:	FA19	0	0	0	6	18	0	6	0	1	1	2	9	0	87	7	16	21	10	7	1	0	0
20:	FA20	0	30	0	78	74	0	40	0	58	0	2	0	0	542	19	82	321	101	23	1	0	0
21:	FA21	0	0	0	34	11	0	19	0	1	0	2	0	0	125	4	19	75	26	14	1	0	0
22:	FA22	0	10	0	18	21	0	7	0	19	0	0	0	0	139	5	21	82	25	3	0	0	0
23:	ME23	0	13	0	34	31	0	46	0	5	0	6	0	2	976	142	459	452	43	87	3	0	0
24:	ME24	0	0	0	14	23	0	19	0	5	0	2	0	2	194	21	43	74	29	15	3	0	0
25:	ME25	0	3	0	3	2	0	5	0	0	0	1	0	0	208	35	93	95	3	12	0	0	0
26:	ME26	0	1	0	1	0	0	1	0	0	0	0	0	0	68	11	30	28	0	2	0	0	0
27:	ME27	0	4	0	11	2	0	12	0	0	0	1	0	0	168	16	137	93	5	30	0	0	0
28:	MD28	0	0	0	69	35	0	58	0	8	0	0	0	0	400	0	58	80	50	16	4	0	0
29:	MD29	0	0	0	27	14	0	28	0	2	0	0	0	0	174	0	22	41	23	4	1	0	0
30:	MD30	0	0	0	14	7	0	10	0	2	0	0	0	0	82	0	12	13	9	4	1	0	0
31:	MD31	0	0	0	6	21	0	30	0	2	0	0	0	0	126	0	16	34	16	2	62	0	1
32:	MD32	0	0	0	45	2	0	6	0	1	0	0	0	0	102	0	15	22	13	3	0	0	0
33:	MD33	0	0	0	9	9	0	17	0	2	0	0	0	0	130	0	72	241	34	57	2	0	0
34:	OR34	0	0	0	9	40	0	13	0	6	0	0	0	0	261	4	21	59	25	5	4	0	0
35:	OR35	0	0	0	11	43	0	26	0	3	0	0	0	0	179	12	17	59	16	10	0	0	0
36:	OR36	0	0	0	2	35	0	20	0	13	0	0	0	1	171	9	47	44	23	3	8	0	0
37:	AD37	0	0	0	11	23	0	10	0	3	0	0	0	0	129	4	14	38	13	1	7	0	0
38:	AD38	0	0	0	23	17	0	16	0	6	0	0	0	0	119	3	12	44	30	2	11	0	0
39:	GM39	0	0	0	9	14	0	12	0	6	0	0	0	0	179	4	12	18	10	4	0	6	0
40:	GM40	0	0	0	11	24	0	13	0	5	0	0	0	0	197	3	23	89	28	5	2	2	0
41:	SC41	0	0	0	162	45	0	59	0	4	0	0	0	0	709	10	63	952	199	698	9	0	0
42:	SC42	0	0	0	13	18	0	19	0	1	0	0	0	0	104	1	17	109	24	3	9	0	0
43:	SC43	0	0	0	52	10	0	17	0	1	0	0	0	0	234	4	16	352	60	224	0	0	0
44:	SC44	0	0	0	47	5	0	8	0	1	0	0	0	0	192	4	15	217	45	132	0	0	0
45:	SC45	0	0	0	50	12	0	15	0	1	0	0	0	0	199	1	15	274	60	339	0	0	0
46:	AG46	0	0	0	7	4	0	8	0	2	0	0	0	0	280	4	7	17	7	2	1	0	0
47:	FC47	0	0	0	2	2	0	3	0	0	0	0	0	0	94	3	7	13	6	1	0	0	0
48:	AP48	0	0	0	30	5	0	27	0	1	0	0	0	0	181	4	29	60	29	1	2	0	0
49:	AP49	0	4	2	44	37	0	47	0	5	5	2	0	0	694	24	249	286	48	69	3	0	0
50:	AP50	0	0	0	20	29	0	25	0	5	2	1	0	0	193	2	45	101	32	16	3	0	0
51:	AR51	0	0	0	5	2	0	4	0	0	1	0	0	0	129	1	40	39	4	9	0	0	0
52:	AR52	0	0	0	1	0	0	0	0	0	0	0	0	0	42	0	10	8	0	2	0	0	0
53:	AR53	0	4	2	9	2	0	10	0	0	0	1	0	0	107	19	98	68	4	26	0	0	0
54:	CA54	0	0	0	19	4	0	14	0	1	0	1	0	0	107	6	19	67	26	3	2	0	0
55:	CA55	0	9	0	44	46	0	43	0	6	3	2	2	3	1019	109	540	506	70	183	6	2	0
56:	CA56	0	0	0	26	24	0	19	0	5	0	2	0	3	208	39	47	89	27	23	3	0	0
57:	CA57	0	0	0	6	16	0	15	0	1	0	0	2	0	225	13	103	198	19	64	1	2	0

Figure III.11.7

CHAPTER 12

UTILITY - TOTAL/UNITS AND WIMP/TOTAL-UNITS

12.1 DESCRIPTION: The purpose of this utility is to determine the total number of units by unit type in the RAM/MATRIX file within each of the four stylized posture arrays. This utility is replaced by the new program called WIMP/TOTAL-UNITS when the WIMP is applied in lieu of the RAM program and methodology. These four stylized posture arrays are: Attack (AT), Defense Intense (DI), Delay (Defend) (DE), and DEF.-LIGHT (Inactive) (DL). This utility must be run once for each of the four postures. The units in the posture arrays will be identified by a second input file which is created by the arrayers for the RAM analyst. Each of the four runs of this will produce two output files. One will identify units in the postured array file for which a match on a corresponding unit in the RAM/MATRIX could not be made. The second and main output from this utility is a file which contains each unit for which a match between the two files could be made and the accumulated total of the number of this type of unit that was found in the RAM/MATRIX file. Each of these four TOTAL/UNIT files will be used as input in a following utility, referred to as TOTAL/CATEGORY.

12.2 STRUCTURE - The overall structure of this utility is pictured in Figure III.12.1. This utility is executed four times, once for each combat posture.

12.3 DATA BASE - The data base used to support this utility is more complex than the data bases which support previous utilities in the Materiel Postprocessor system. The utility must be run four times using two input files and will produce two output files. In all cases the RAM/-MATRIX file will be used as one of the input files. The second input file which identifies those units in one of the four particular postures and will change from run to run using the appropriate posture file. These four posture files will be supplied by the RAM analyst. The utility will produce two output files for each run. One file (the MISSED/-UNITS) will identify those units which were identified on the posture array file but not found in the RAM/MATRIX. The second file will contain all units which were found to be in the particular posture and the total number of each unit in that posture.

All files will be found on the system mass storage devices and be cataloged as elements under the current study's general file.

12.4 RUNSTREAM - Figure III.12.2 details the runstream that is used to control and execute the running of this utility. Figure III.12.2A depicts the alternate program runstream. The runstream is currently cataloged as an element under the file CSTART*82XQT under the element name TOTAL/UNITS.

As the utility executes it accomplishes the following functions:

- o Assigns the logical unit 88 to the study's general file, in the current example SECRET*82WARFP88, and requires the user to supply the appropriate password to gain access to it prior to using the runstream.

- o Assigns logical unit 7 to the current posture array file being used. This file will contain the unit identification data for this particular posture. The file name must be changed from run to run to reflect the proper posture being used. In this example, the file name is 94STOREA.

- o Assigns logical unit 7 to the RAM/MATRIX input file.

- o Assigns logical units 9 and 10 as output files.

- o Executes the utility.

- o Copies the contents of logical unit 10 to the permanent file TOTAL/UNITS-XX. The "XX" portion of this file name must be changed on each running of the utility to reflect the appropriate posture.

Appropriate replacements for XX are:

Posture ID	Description
AT	- Attack posture
DI	- Defense Intense (Defend) posture
DE	- Delay posture
DL	- Defense Light (Inactive) posture

This output file will be cataloged under the current study's general file.

- o Copies the contents of logical unit 9 to the permanent file MISSED/UNITS-XX. Once again the XX position must be replaced on each run using the appropriate 2 character posture ID.

- o Releases the resources allocated for this run.

12.5 INPUT - This utility will be run four times; once for each of the four stylized posture arrays that are used in the study. Each run of the utility will use the RAM/MATRIX file and one of the four posture array files. These files will be categorized as elements under the current study's general file. The RAM/MATRIX file will use RAM/MATRIX as its element name; the element name of the four posture files must be obtained from the RAM analyst.

The RAM/MATRIX file is produced by the RAM/MATRIX utility which was completed earlier. The purpose of the file is to identify all units by unit type participating in the study arrays and specify for each of the 22

artillery vulnerability categories in the study, the total number of units of equipment which were grouped into each vulnerability category. The present utility concentrates on the unit type portion of the record and ignores the vulnerability category portion.

The second input file used by this utility is one of the stylized posture array files. This file is supplied by the RAM analyst who also should be contacted for the proper element name. This file is simply a listing of array units which includes the four character unit type codes which identify the unit types which can be found in this particular battle posture in the study.

Figure III.12.3 depicts the data example for the RAM/MATRIX files. Figure III.12.4 despicts the example for the stylized posture array file.

FILE: ARRAYED LIST OF UNITS BY POSTURE (94STOREA)
STORAGE MEDIUM: Mass Storage
SOURCE: RAM ANALYST

RECORD FORMAT:

Position	Description	Format
1 - 70	Blanks	70X
71 - 74	Unit Type Code with the Posture Array	A4

FILE: RAM/MATRIX

STORAGE MEDIUM: Mass Storage

SOURCE: Utility - RAM/MATRIX

RECORD FORMAT:

Position	Description	Format
1	Blank	1X
2 - 3	First 2 characters of the Unit Unit Type Code	A2
4 - 5	Subscript of the above Code	I2
6 - 93	Accumulated Quantities for Lincodes and their corresponding Vulnerability Categories.	2214

12.6 OUTPUTS - This utility produces two mass storage files as output for each of the four stylized arrays. One details those unit types which were expected to be in a particular posture as stated on the posture array input file but were not detected on the RAM/MATRIX file. This file is referred to as the MISSED/UNITS-XX file. The XX portion of the element name must be changed to reflect the appropriate posture being analyzed in this run; i.e., AT, DI, DE, or DL. This file uses one record type consisting of one four character field, the Unit Type Code ID. The second output file of this utility is the TOTAL/UNITS-XX file. This is the major output from this utility. Once again the XX portion of the file name must be changed to reflect the posture being analyzed. This file consists of one record type. Each record is composed of 2 fields. The first field is the four character unit type code identifier. The second field in the record is a four character integer number which denotes the total number of this particular unit type that was found in the RAM/MATRIX.

For example, line 1 of Figure III.12.6, (the data example of the TOTAL/UNITS file), indicates that there were 2 units in the RAM/-MATRIX file for UNIT TYPE L197 in the particular posture array.

The file is cataloged as an element under the current study's general file.

Figure III.12.5 presents examples of the data for the MISSED/UNITS-XX file. Figure III.12.6 portrays the data example for the TOTAL/UNITS-XX file. Figure III.12.6A depicts the sample output when the alternate program is used.

FILE: MISSED/UNITS-XX
STORAGE MEDIUM: Mass Storage
SOURCE: UTILITY - TOTAL/UNITS

RECORD FORMAT:

Position	Description	Format
1 - 4	Unit Type Codes from Stylized Array for which no match was found in the RAM/MATRIX file.	A4

FILE: TOTAL/UNITS - XX

STORAGE MEDIUM: Mass Storage

SOURCE: UTILITY - TOTAL/UNITS

RECORD FORMAT:

Position	Description	Format
1 - 4	Unit Type Code	A4
5 - 6	Blanks	2X
7 - 10	Total Number of Units for this Unit Type in this posture.	I4

12.7 PERFORMANCE - This utility will require the following resources:

CORE:	10K OR LESS
CPU TIME:	2 MIN OR LESS
CLOCK TIME:	10 MIN OR LESS
DISK UNITS:	1 - 2
COMMENTS:	NONE

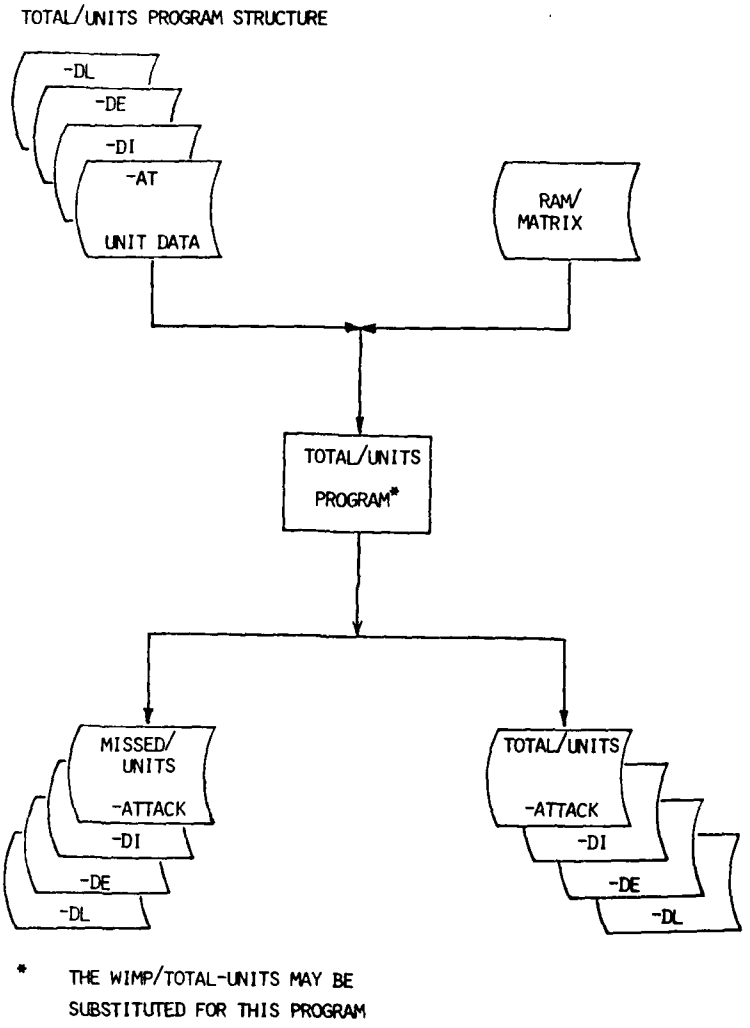


Figure III.12.1

```
UNCLASSIFIED***FILE NAME:COSTART*82XQT  ELEMENT NAME:TOTAL/UNITS***UNCLASSIFIED

  1:@USE 88.,SECRET*82WARFP88.
  2:@ASG,A 88/     /    .
  3:@ASG,T 8.
  4:@ASG,A 94STOREA.
  5:@ED  94STOREA,1,8.
  6:EXIT
  7:@MSG,N  THE ABOVE PROGRAM FILE "94STOREA" IS CREATED BY THE RAM
  8:@MSG,N  ANALYST AS INPUT TO THE TAM. A CHECK MUST BE MADE WITH THE RAM
  9:@MSG,N  ANALYST AS TO THE CURRENT STUDY'S FILE NAME. THE PROGRAM FILE
 10:@MSG,N  CONTAINS THE UNIT DATA FOR EACH STYLIZED POSTURE ARRAY AS ELEMENTS.
 11:@MSG,N  THIS UTILITY MUST BE RUN FOUR TIMES (ONCE FOR EACH POSTURE)
 12:@MSG,N  CHANGING THE ELEMENT NAME TO CORRESPOND TO THE APPPOPRIATE
 13:@MSG,N  POSTURE.
 14:@ASG,T 7.
 15:@ED  88.RAM/MATRIX,7.
 16:EXIT
 17:@MSG,N  THE ABOVE ELEMENT FILE "RAM/MATRIX" CONTAINS THE
 18:@MSG,N  TOTAL EQUIPMENT BY ARTILLERY VULNERABILITY CATEGORY FOR
 19:@MSG,N  EACH OF THE TYPE OF UNITS IN THE ARRAY.
 20:@ASG,T 9.
 21:@ASG,T 10.
 22:@ASG,A 82XQT.
 23:@XQT 82XQT.TOTAL/UNITS
 24:@ED  10.,88.TOTAL/UNITS-AT
 25:LNP!
 26:EXIT
 27:@MSG,N  THE ABOVE ELEMENT FILE "TOTAL/UNITS" CONTAINS THE OUTPUT
 28:@MSG,N  PRODUCED BY THIS UTILITY.  THE OUTPUT CONTAINS THE TOTAL
 29:@MSG,N  NUMBER OF UNITS BY TYPE IN THE ARRAY.
 30:@MSG,N  THE ABOVE ELEMENT NAME MUST BE CHANGE FOR EACH POSTURE.
 31:@ED  9.,83.MISSED/UNITS-AT
 32:LNP!
 33:EXIT
 34:@MSG,N  THE ABOVE ELEMENT FILE "MISSED/UNITS-AT" PROVIDES A
 35:@MSG,N  LIST OF ANY UNITS FOR WHICH A MATCH COULD NOT BE
 36:@MSG,N  FOUND.
 37:@MSG,N  THE ABOVE ELEMENT NAME MUST BE CHANGE FOR EACH POSTURE.
 38:@FREE 7.
 39:@FREE 8.
 40:@FREE 9.
 41:@FREE 10.
 42:@FREE 88.
```

Figure III.12.2

```
UNCLASSIFIED***FILE NAME:USTAFT*R2*OCT  ELEMENT NAME:RAMP/TOTAL-UNITS***UNCLASSIF

  1:.USE RF.,SECRET*R2*ARFPPB.
  2:.ASG,A *R/    /  .
  3:.ASG,T 5.
  4:&ASG,A R2*IMPDATA.
  5:.ED   *R*IMPDATA.UP.TXXX,6.
  6:&EXIT
  7:&MSG,N   THE ABOVE ELEMENT "UNITXXX" WAS CREATED BY THE COSAGE
  8:&MSG,N   ARRAYERS.  THE WARE ANALYST MUST CHECK WITH THE ARRAYERS
  9:&MSG,N   TO INSURE THE ELEMENT CONTAINS THE LATEST UNIT DATA.
 10:&MSG,N   THIS UTILITY MUST BE EXECUTED FOUR TIMES (ONCE FOR EACH
 11:&MSG,N   POSTURE).  THE "XXX" PORTION OF THE ELEMENT NAME MUST
 12:&MSG,N   CHANGED TO CORRESPOND WITH THE APPROPRIATE POSTURE.
 13:&ASG,T 7.
 14:.ED   *R.RAM/MATRIX,7.
 15:&EXIT
 16:&MSG,N   THE ABOVE ELEMENT "RAM/MATRIX" CONTAINS THE TOTAL
 17:&MSG,N   EQUIPMENT AUTHERIZED BY ARTILLERY VULNERABILITY
 18:&MSG,N   CATEGORY BY TYPE OF UNIT TOE. THIS ELEMENT IS NOT
 19:&MSG,N   FROM ONE POSTURE TO THE NEXT.
 20:&ASG,T 9.
 21:&ASG,T 10.
 22:&ASG,A R2*IMP.
 23:&XQT R*IMP.RIMP/TOTAL-UNITS
 24:&ED   1*.,&A.TOTAL/UNITS-XX
 25:&ENP
 26:&EXIT
 27:&MSG,N   THE ABOVE ELEMENT "TOTAL/UNITS-XX" CONTAINS THE PRIMARY
 28:&MSG,N   OUTPUT DATA PRODUCED BY THIS UTILITY.  THIS DATA
 29:&MSG,N   IS A LIST OF TOTAL UNITS IN THE ARRAY BY TYPE OF
 30:&MSG,N   TOE.
 31:&MSG,N   THE "XX" PORTION OF THE ELEMENT NAME MUST BE
 32:&MSG,N   CHANGED TO REFLECT THE APPROPRIATE POSTURE.
 33:&ED   %.,&B.MISSED/UNITS-XX
 34:&ENP
 35:&EXIT
 36:&MSG,N   THE ABOVE ELEMENT "MISSED/UNITS-XX" PROVIDES A
 37:&MSG,N   LIST OF UNITS, IF ANY, FOR WITH A MATCH COULD NOT BE
 38:&MSG,N   FOUND BETWEEN THE UNITXXX AND RAM/MATRIX FILES.
 39:&MSG,N   THE "XX" PORTION OF THE ELEMENT NAME MUST BE CHANGED TO
 40:&MSG,N   REFLECT THE APPROPRIATE POSTURE.
 41:&ERR  7.
 42:&ERR  8.
 43:&ERR  9.
 44:&ERR  10.
 45:&ERR  12.
```

Figure III.12.2A

UNCLASSIFIED***EXAMPLE OF THE OUTPUT DATA OF UTILITY RAM/MATRIX***UNCLASSIFIED

1:	CH01	0	0	0	23	22	0	24	0	0	0	0	0	0	121	13	87	24	73	1	0	0	9
2:	CN02	0	0	4	55	88	0	86	0	20	10	0	0	4	1142	79	315	271	101	147	26	0	15
3:	CN03	0	0	0	24	32	0	24	0	7	2	0	0	4	202	9	55	71	43	11	7	0	15
4:	CN04	0	0	0	5	9	0	12	0	2	2	0	0	0	194	15	51	36	9	30	4	0	0
5:	CN05	0	0	4	11	20	0	14	0	5	0	0	0	0	150	6	56	56	22	16	3	0	0
6:	FA06	0	0	0	35	14	0	17	0	2	0	0	0	0	215	10	53	131	37	25	1	0	0
7:	FA07	0	19	0	43	39	0	24	0	5	0	2	54	2	845	74	136	356	78	118	3	0	0
8:	FA08	0	0	0	29	3	0	13	0	1	0	0	0	0	240	17	51	234	43	73	2	0	0
9:	FA09	0	6	0	3	6	0	2	0	1	0	0	15	0	108	17	22	34	8	13	0	0	0
10:	FA10	0	0	0	5	18	0	5	0	1	0	2	9	2	91	6	19	20	11	6	1	0	0
11:	FA11	0	19	0	59	54	0	37	0	21	1	2	48	0	767	82	170	416	115	106	7	0	0
12:	FA12	0	1	0	34	4	0	15	0	1	0	0	0	0	234	20	61	224	53	58	1	0	0
13:	FA13	0	4	0	4	8	0	3	0	1	0	0	12	0	105	14	21	37	8	10	1	0	0
14:	FA14	0	6	0	7	3	0	4	0	1	0	0	0	0	94	11	26	58	25	11	1	0	0
15:	FA15	0	0	0	6	23	0	9	0	16	1	2	12	0	134	9	20	23	13	7	2	0	0
16:	FA16	0	12	0	42	42	0	28	0	5	1	2	42	0	544	57	123	210	53	64	1	0	0
17:	FA17	0	0	0	27	3	0	16	0	1	0	0	0	0	145	11	41	93	19	21	0	0	0
18:	FA18	0	4	0	3	7	0	2	0	1	0	0	11	0	104	13	22	32	8	12	0	0	0
19:	FA19	0	0	0	6	18	0	6	0	1	1	2	9	0	97	7	16	21	10	7	1	0	0
20:	FA20	0	30	0	78	74	0	40	0	58	0	2	0	0	542	19	32	321	101	23	1	0	0
21:	FA21	0	0	0	24	11	0	19	0	1	0	2	0	0	125	4	19	75	26	14	1	0	0
22:	FA22	0	10	0	18	21	0	7	0	19	0	0	0	0	139	5	21	82	25	3	0	0	0
23:	MC23	0	13	0	34	31	0	46	0	5	0	6	0	2	976	142	459	452	43	87	3	0	0
24:	MC24	0	0	0	14	23	0	19	0	5	0	2	0	2	194	21	43	74	29	15	3	0	0
25:	MC25	0	3	0	3	2	0	5	0	0	0	1	0	0	208	35	93	95	3	12	0	0	0
26:	MC26	0	1	0	1	0	0	1	0	0	0	0	0	0	68	11	30	28	0	2	0	0	0
27:	MC27	0	4	0	11	2	0	12	0	0	0	1	0	0	168	16	137	93	5	36	0	0	0
28:	MC28	0	0	0	69	35	0	58	0	8	0	0	0	0	400	0	58	80	50	16	4	0	0
29:	MC29	0	0	0	27	14	0	28	0	2	0	0	0	0	154	0	22	41	23	4	1	0	0
30:	MC30	0	0	0	14	7	0	10	0	2	0	0	0	0	92	0	12	13	9	4	1	0	0
31:	MC31	0	0	0	6	21	0	30	0	2	0	0	0	0	126	0	16	34	16	2	62	0	1
32:	MC32	0	0	0	45	2	0	6	0	1	0	0	0	0	102	0	15	22	13	3	0	0	0
33:	MC33	0	0	0	9	9	0	17	0	2	0	0	0	0	190	0	72	241	74	57	2	0	0
34:	OR34	0	0	0	8	40	0	13	0	6	0	0	0	0	261	4	21	59	25	5	4	0	0
35:	OR35	0	0	0	11	43	0	26	0	3	0	0	0	0	199	12	17	59	16	10	0	0	0
36:	OR36	0	0	0	2	35	0	20	0	13	0	0	0	1	171	9	47	44	23	3	8	0	0
37:	AD37	0	0	0	11	23	0	10	0	3	0	0	0	0	129	4	14	38	13	1	7	0	0
38:	AD38	0	0	0	23	17	0	16	0	6	0	0	0	0	119	3	12	44	20	2	11	0	0
39:	SM39	0	0	0	9	14	0	12	0	6	0	0	0	0	129	4	12	18	10	4	0	6	0
40:	CM40	0	0	0	11	24	0	13	0	5	0	0	0	0	197	3	23	89	28	5	2	2	0
41:	SC41	0	0	0	162	45	0	59	0	4	0	0	0	0	709	10	63	952	199	698	9	0	0
42:	SC42	0	0	0	13	18	0	19	0	1	0	0	0	0	104	1	17	109	24	3	9	0	0
43:	SC43	0	0	0	52	10	0	17	0	1	0	0	0	0	234	4	16	352	60	224	0	0	0
44:	SC44	0	0	0	47	5	0	8	0	1	0	0	0	0	182	4	15	217	45	132	0	0	0
45:	SC45	0	0	0	50	12	0	15	0	1	0	0	0	0	189	1	15	274	50	339	0	0	0
46:	AC46	0	0	0	7	4	0	8	0	2	0	0	0	0	299	4	7	17	7	2	1	0	0
47:	FC47	0	0	0	2	2	0	3	0	0	0	0	0	0	94	3	7	13	6	1	0	0	0
48:	AP48	0	0	0	30	5	0	27	0	1	0	0	0	0	131	4	29	60	29	1	2	0	0
49:	AP49	0	4	2	44	37	0	47	0	5	5	2	0	0	694	24	249	286	48	69	3	0	0
50:	AP50	0	0	0	20	29	0	25	0	5	2	1	0	0	193	2	45	101	32	16	3	0	0
51:	AR51	0	0	0	5	2	0	4	0	0	1	0	0	0	129	1	40	39	4	9	0	0	0
52:	AP52	0	0	0	1	0	0	0	0	0	0	0	0	0	42	0	10	8	0	2	0	0	0
53:	AP53	0	4	2	9	2	0	10	0	0	0	1	0	0	107	19	94	68	4	26	0	0	0
54:	CA54	0	0	0	19	4	0	14	0	1	0	1	0	0	107	6	19	67	26	3	2	0	0
55:	CA55	0	9	0	44	46	0	43	0	6	3	2	2	3	1039	109	540	506	70	183	6	2	0
56:	CA56	0	0	0	26	24	0	19	0	5	0	2	0	3	208	39	47	89	27	23	3	0	0
57:	CA57	0	0	0	6	16	0	15	0	1	0	0	2	0	225	13	103	198	19	64	3	2	0

Figure III.12.3

```
UNCLASSIFIED*34WARFRAM87(1).AQTARGETDE
     1          0 252508268 900113 7031 47 0 3 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0  3  3ME17
     2          1 204550271 510011 7051 42 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0  0  0IP09
     3          5 105405261410011 3051 62 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0  0  0MT10
     4          7 183514254 510011 2051 16 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0  0  0HC10
     5          7 344465151111 0012 3032 59 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0  0  0EN70
     6          8   3487270 100121 1051  8 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0  0  0AT02
     7          9 123419266 501011 2051 36 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0  0  0MG10
     8         12 202543272 501011 7051 42 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0  0  0IP09
     9         12 340462082110 0112 4042111 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0  0  0EN61
    10         15 177527266141 0013 2031 42 0 3 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0  3  3IW09
    11         16 166522270121 0011 4051128 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0  0  0IR03
    12         17 260446198 210016 3032151 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0  0  0AW19
    13         17  114792001110 0012 3032134 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0  0  0GL207
    14         17  77471266 810013 2031  8 2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0  2  2TC11
    15         19 103413266 510011 2051 36 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0  0  0MG10
    16         21  78467270 810013 8031 20 4 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0  4  4TP11
    17         23 257459268 910012 7021 34 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0  0  0ME17
    18         23 208552270 510011 7051 42 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0  0  0IP09
    19         26   9473165 510012 3032147 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0  0  0CS05
    20         28 114429268 510011 7051 42 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0  0  0IP09
    21         29 273513251111 0012 2021 20 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0  0  0EN32
    22         29 246463261 800113 8031 20 4 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0  4  4TP11
    23         29  82464265 810013 8031 20 4 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0  4  4TP11
    24         30  964042641410011 2051 42 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0  0  0IW09
    25         31 167517251121 0012 9021 96 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0  0  0IB08
    26         33 121437264141 0012 2021 42 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0  0  0IW09
    27         35  92402259 510012 2021 20 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0  0  0IC09
    28         39 268446189111 0012 3032113 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0  0  0EN31
    29         40 210552611410011 2051 42 0 3 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0  0  0IW09
    30         42 175531273 510011 7051 42 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0  0  0IP09
    31         42 302437187100 0112 2022 18 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0  0  0ML34
```

Figure III.12.4

```
UNCLASSIFIED***EXAMPLE OF OUTPUT FROM UTILITY TOTAL/UNITS

   1:CH2 3
   2:AR3 5
   3:IN4 2
   4:AH5 7
```

Figure III.12.5

UNCLASSIFIED•••EXAMPLE OF OUTPUT OF UTILITY TOTAL/UNITS•••UNCLASSIFIED

1:L197	2
2:L199	1
3:L2A1	1
4:L2A2	1
5:L383	1
6:L2A3	1
7:L427	4
8:SC51	1
9:SC58	1
10:SC52	1
11:SC53	1
12:SC54	1
13:SC55	1
14:SC56	1
15:SC35	4
16:SC36	4
17:SC37	5
18:SC39	4
19:TR11	7
20:TC11	28
21:TP11	84
22:MF16	4
23:MC17	8
24:MS17	24
25:MT17	8
26:RC06	8
27:R933	4
28:ML34	4
29:MP34	12
30:MI34	4
31:ML72	1
32:L193	1
33:L207	4
34:AH47	1
35:AP47	2
36:AT47	2
37:AD79	1
38:AD80	1
39:AD81	2
40:AW13	4
41:L291	1
42:CP41	1
43:L492	8
44:CS93	1
45:L494	1
46:L495	1
47:L496	1
48:MS12	4
49:MS13	4
50:MS14	4
51:MS15	4
52:RW33	4
53:CH30	4
54:CH59	1
55:CH60	1
56:CH59	1
57:AD46	2

Figure III.12.6

UNCLASSIFIED***EXAMPLE OF THE OUTPUT OF UTILITY WIMP/TOTAL-UNITS**

```
 1:FA14      1
 2:FA15      9
 3:FA16     18
 4:FA19      1
 5:FA17      7
 6:FA18      3
 7:ME  2     3
 8:ME  3     4
 9:ME  4    15
10:ME  5    32
11:FA  6     1
12:ME  7     3
13:ME  8    11
14:AR  1     1
15:AR  9     6
16:AR10     14
17:AR11     41
18:AR12      4
19:AR13     12
20:AH20      3
```

Figure III.12.6A

CHAPTER 13

UTILITY - TOTAL/CATEGORY AND WIMP TOTAL-CAT

13.1 DESCRIPTION: The purpose of this utility is to produce the total authorized quantity of equipment for each of the 22 artillery vulnerability categories found in one of the four stylized posture arrays. The new program, WIMP/TOTAL-CAT may be applied in lieu of this program. In accomplishing this function the utility is run once for each of the posture arrays using the RAM/MATRIX file and the appropriate TOTAL/UNIT-XX file. The utility will first multiply the total number of units in a unit type as specified in the TOTAL/UNIT-XX file by the number of items of equipment in a particular vulnerability category as specified in the RAM/MATRIX file. The final step in this process is to determine the total number of items of equipmentin each of the 22 vulnerability categories by summing each of the categories across all unit types. The result will be an array, 22 entries in length, one entry for each artillery vulnerability category and the total number of items of equipment authorized for that category for a specific posture.

13.2 STRUCTURE - Figure III.13.1 depicts the overall structure of the utility.

13.3 DATA BASE - The data base that is used to support this utility consists of two types of input files and one type of output file. The input files are the RAM/MATRIX and the four TOTAL/UNITS-XX files. The output file will be one of the four TOTAL/CATEGORY-XX files. This utility as the previous TOTAL/UNITS utility, must run four times, once for each posture. Each run of the utility will produce a TOTAL/CATEGORY-XX output file.

All files will be maintained on mass storage devices and be cataloged under the study's general program file.

13.4 RUNSTREAM - Figure III.13.2 depicts the runstream which currently controls the execution of this utility. The runstream is cataloged as an element under the file CSTART*82XQT using element name: TOTAL/-CATEGORY. The alternate utility is controlled by the runstream in Figure III.13.2A. As the runstream executes it will accomplish the following functions:

- o Assign to the logical unit 88 the current study's general file; in this example SECRET*82WARFP88. It further requires the user to supply the proper password to gain access to the file.
- o Assigns logical unit 7 the RAM/MATRIX file and to logical unit 8 the TOTAL/UNIT-XX file. As is always the case, the "XX" portion of the TOTAL/UNITS file name must be changed to reflect the appropriate posture being analyzed.

- o Assigns logical unit 9 to be used as an output file.
- o Executes the utility.
- o Copies of the results of the utility collected in logical unit 9 to the permanent file TOTAL/CATEGORIES-XX. The "XX" portion of this file name must also be changed to reflect the proper posture being analyzed.
- o Releases the allocated resources.

13.5 INPUT - There are two input files required to run this utility. Both files will be cataloged as elements under the general file for the current study. The first file is the RAM/MATRIX. This file details for each type of unit in the study the number of items of equipment that the unit has been authorized classified in the 22 EQUIPMENT/ARTILLERY vulnerability categories. The second file used as input will be one of the TOTAL/UNIT-XX files. This file will denote the total number of unit types found in the particular posture array.

Figure III.13.3 depicts the RAM/MATRIX file example data. Figure III.13.4 depicts the data example for the TOTAL/UNITS-XX file.

FILE: RAM/MATRIX
STORAGE MEDIUM: Mass Storage
SOURCE: Utility - RAM/MATRIX

RECORD FORMAT:

Position	Description	Format
1	Blank	1X
2 - 3	First 2 characters of the Unit Type Code	A2
4 - 5	Subscript of the above Code	I2
6 - 93	Accumulated Quantities for Lincodes and their corresponding Vulnerability Categories.	2214

FILE: TOTAL/UNITS - XX

STORAGE MEDIUM: Mass Storage

SOURCE: UTILITY - TOTAL/UNITS

RECORD FORMAT:

Position	Description	Format
1 - 4	Unit Type Code	A4
5 - 6	Blanks	2X
7 - 10	Total Number of units for this Unit Type in this posture.	I4

13.6 OUTPUT - The TOTAL/CATEGORY-XX file is the only output file from each run of this utility. As with the TOTAL/UNITS utility, the TOTAL/CATEGORY utility must be run four times; once for each of the four posture arrays of the study.

The output file will have one record type and 22 records; one for each of the 22 artillery vulnerability categories of the study. Each record will consist of one seven-digit integer field. This field will contain the total number of items of equipment found in a specific posture array for a single vulnerability category. For example, in Figure 13.8 line 5 indicates that 4,060 items of equipment are being played in this posture which have been assigned an artillery vulnerability category of 5.

These 22 totals in this posture will become the denominators of the equation which will be used to determine the WARFRAM loss rates within a posture's stylized array. The RAM(WARF) simulation runs for each posture will provide the number of equipment items lost by vulnerability category. These figures will be used as the numerators in the equation. These loss rates will be manually computed and entered into the element "CONTROL/TEMP" of the current study's general file and be used as an input file to a subsequent utility.

Figures III.13.5 and III.13.5A present the data example for the TOTAL/CATEGORY-XX file.

FILE: TOTAL/CATEGORY = AT, DE, DI, DL
STORAGE MEDIUM: Mass Storage
SOURCE: UTILITY - TOTAL/CATEGORY

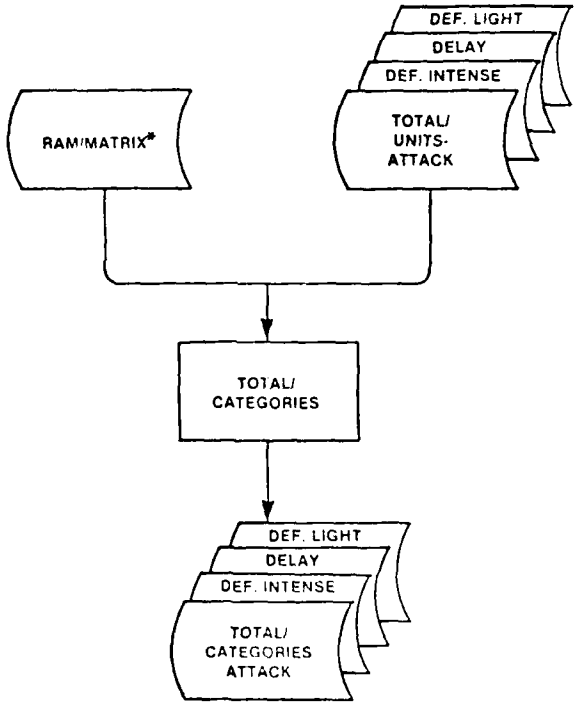
RECORD FORMAT:

Position	Description	Format
1 - 7	Quantity Totals for each of the 22 Vulnerability Categories	I7

13.7 PERFORMANCE - This utility will require the following system resources to be allocated:

CORE:	10K OR LESS
CPU TIME:	5 MIN OR LESS
CLOCK TIME:	10 MIN OR LESS
DISK UNITS:	1 - 2
COMMENTS:	NONE

TOTAL/CATEGORIES STRUCTURE



* The WIMP/MATRIX program may be named in lieu of RAM/MATRIX

Figure III.13.1

```
UNCLASSIFIED***FILE NAME:COSTART•82XQT  ELEMENT NAME:TOTAL/CATEGORY***UNCLASSIFIE

  1:&USE 88.,SECRET•82WARFR88.
  2:&ASG•A 83/     /    .
  3:&ASG•T 7.
  4:&ED   98.RAM/MATRIX•7.
  5:EXIT
  6:&MSG•N  THE ABOVE ELEMENT FILE "RAM/MATRIX" CONTAINS THE
  7:&MSG•N  TOTAL AUTHERIZED EQUIPMENT FOR EACH OF THE 22 ARTILLERY
  8:&MSG•N  VULNERABILITY CATEGORIES BY TYPE UNIT.
  9:&ASG•T 9.
 10:&ED   88.TOTAL/UNITS-AT•9.
 11:EXIT
 12:&MSG•N  THE ABOVE ELEMENT FILE "TOTAL/UNITS-AT" CONTAINS THE
 13:&MSG•N  TOTAL NUMBER OF UNITS FOUND IN THE ATTACK POSTURES
 14:&MSG•N  STYLIZED ARRAY.  THIS ELEMENT NAME MUST BE CHANGED PRIOR
 15:&MSG•N  TO EXECUTION OF THIS UTILITY FOR THE OTHER THREE REMAINING
 16:&MSG•N  POSTURES.
 17:&ASG•T 8.
 18:&ASG•A 82XQT.
 19:&XQT 82XQT.TOTAL/CATEGORY
 20:&ED   9.,88.TOTAL/CATEGORY-AT
 21:ENDF
 22:EXIT
 23:&MSG•N  THE ABOVE ELEMENT FILE "TOTAL/CATEGORY-AT" CONTAINS THE
 24:&MSG•N  OUTPUT DATA FROM THIS UTILITY FOR THE ATTACK POSTURE.
 25:&MSG•N  THIS ELEMENT NAME MUST BE CHANGED FOR PRIOR TO EXECUTION OF
 26:&MSG•N  THE UTILITY FOR THE THREE REMAINING POSTURES.
 27:&FREE 7.
 28:&FREE 8.
 29:&FREE 9.
 30:&FREE 88.
```

Figure III-13-2

```
UNCLASSIFIED***FILE NAME:START*82GO  ELEMENT NAME:WIMP/TOTAL-CAT***UNCLASSIFIED

  1:@USE 88.,82STUDY.
  2:@ASG,A 88.
  3:@ASG,T 7.
  4:@ED  88.RAM/MATRIX,7.
  5:EXIT
  6:@MSG,N  THE ABOVE ELEMENT "RAM/MTRIX" CONTAINS THE TOTAL
  7:@MSG,N  AUTHIZED EQUIPMENT FOR EACH OF THE 22 EQUIPMENT
  8:@MSG,N  ARTILLERY VULNERABILITY CATEGORIES BY TYPE UNIT.
  9:@ASG,T 8.
 10:@ED  88.WIMP/TOTAL-UNITS-XX,8.
 11:EXIT
 12:@MSG,N  THE ABOVE ELEMENT "WIMP/TOTAL-UNITS-XX" CONTAINS
 13:@MSG,N  THE TOTAL NUMBER OF UNITS FOUND IN THE STYLIZED
 14:@MSG,N  POSTURE ARRAY.  THE PORTION "XX" OF THE ELEMENT
 15:@MSG,N  NAME MUST BE CHANGED TO REFLECT THE APPROPRIATE
 16:@MSG,N  POSTURE (IE. AT, DI, DE OR DL).
 17:@ASG,T 9.
 18:@ASG,A 82WIMP.
 19:@XQT 82WIMP.WIMP/TOTAL-CAT
 20:@ED  9.,88.WIMP/TOTAL-CAT-XX
 21:LNP
 22:EXIT
 23:@MSG,N  THE ABOVE ELEMENT "WIMP/TOTAL-CAT-XX" CONTAINS THE
 24:@MSG,N  OUTPUT DATA FROM THIS UTILITY.  THE "XX" PORTION OF
 25:@MSG,N  THE ELEMENT NAME MUST CHANGED TO REFLECT THE
 26:@MSG,N  APPROPRIATE POSTURE (IE. AT, DI, DE OR DL).
 27:@FREE 7.
 28:@FREE 8.
 29:@FREE 9.
 30:@FREE 88.
```

Figure III.13.2A

UNCLASSIFIED***EXAMPLE OF THE OUTPUT DATA OF UTILITY RAM/MATRIX***UNCLASSIFIED

1:	CH01	0	0	0	23	22	0	24	0	0	0	0	0	0	121	13	87	24	73	1	0	0	9
2:	CH02	0	0	4	55	88	0	96	0	20	10	0	0	4	1142	79	315	271	101	147	26	0	15
3:	CH03	0	0	0	24	32	0	24	0	7	2	0	0	4	202	9	55	71	43	11	7	0	15
4:	CH04	0	0	0	5	9	0	12	0	2	2	0	0	0	134	15	51	36	9	30	4	0	0
5:	CH05	0	0	4	11	20	0	14	0	5	0	0	0	0	150	6	56	56	22	16	3	0	0
6:	CH06	0	0	0	35	14	0	17	0	2	0	0	0	0	215	10	53	131	37	25	1	0	0
7:	CH07	0	19	0	43	39	0	24	0	5	0	2	54	2	545	74	130	356	78	118	3	0	0
8:	CH08	0	0	0	29	3	0	13	0	1	0	0	0	0	240	17	51	234	43	73	2	0	0
9:	CH09	0	6	0	7	6	0	2	0	1	0	0	15	0	108	17	22	34	8	13	0	0	0
10:	CH10	0	0	0	7	18	0	5	0	1	0	2	9	2	81	6	19	20	11	6	1	0	0
11:	CH11	0	19	0	59	54	0	37	0	21	1	2	48	0	767	82	170	410	115	106	7	0	0
12:	CH12	0	1	0	34	4	0	15	0	1	0	0	0	0	234	20	61	224	53	58	1	0	0
13:	CH13	0	4	0	4	8	0	3	0	1	0	0	12	0	105	14	21	37	8	10	1	0	0
14:	CH14	0	6	0	7	3	0	4	0	1	0	0	0	0	84	11	20	58	25	11	1	0	0
15:	CH15	0	0	0	6	23	0	9	0	10	1	2	12	0	134	9	30	23	13	7	2	0	0
16:	CH16	0	12	0	42	42	0	28	0	5	1	2	42	0	544	57	123	210	53	64	1	0	0
17:	CH17	0	0	0	27	3	0	16	0	1	0	0	0	0	145	11	41	93	19	21	0	0	0
18:	CH18	0	4	0	3	7	0	2	0	1	0	0	11	0	104	13	22	32	8	12	0	0	0
19:	CH19	0	0	0	6	18	0	6	0	1	1	2	9	0	97	7	16	21	10	7	1	0	0
20:	CH20	0	30	0	76	74	0	40	0	58	0	2	0	0	542	19	82	321	101	23	1	0	0
21:	CH21	0	0	0	24	11	0	19	0	1	0	2	0	0	125	4	19	75	20	14	1	0	0
22:	CH22	0	10	0	18	21	0	7	0	19	0	0	0	0	139	5	21	82	25	3	0	0	0
23:	MF23	0	13	0	34	31	0	46	0	5	0	6	0	2	976	142	459	452	43	87	3	0	0
24:	MF24	0	0	0	14	23	0	19	0	5	0	2	0	2	184	21	43	74	29	15	3	0	0
25:	MF25	0	3	0	3	2	0	5	0	0	0	1	0	0	203	35	93	95	3	12	0	0	0
26:	MF26	0	1	0	1	0	0	1	0	0	0	0	0	0	68	11	30	28	0	2	0	0	0
27:	MF27	0	4	0	11	2	0	12	0	0	0	1	0	0	158	10	137	93	5	30	0	0	0
28:	MF28	0	0	0	59	35	0	58	0	8	0	0	0	0	400	0	58	80	50	16	4	0	0
29:	MF29	0	0	0	27	14	0	28	0	2	0	0	0	0	154	0	22	41	23	4	1	0	0
30:	MF30	0	0	0	14	7	0	10	0	2	0	0	0	0	92	0	12	13	9	4	1	0	0
31:	MF31	0	0	0	6	21	0	10	0	2	0	0	0	0	126	0	16	34	16	2	62	0	1
32:	MF32	0	0	0	45	2	0	6	0	1	0	0	0	0	102	0	15	22	13	3	0	0	0
33:	MF33	0	0	0	9	9	0	17	0	2	0	0	0	0	130	0	72	241	74	57	2	0	0
34:	MF34	0	0	0	3	40	0	13	0	6	0	0	0	0	261	4	21	53	25	5	4	0	0
35:	MF35	0	0	0	11	43	0	26	0	3	0	0	0	0	139	12	17	59	16	10	0	0	0
36:	MF36	0	0	0	2	35	0	20	0	13	0	0	0	1	171	9	47	44	23	3	8	0	0
37:	MF37	0	0	0	11	23	0	10	0	3	0	0	0	0	129	4	14	38	13	1	7	0	0
38:	MF38	0	0	0	23	17	0	16	0	6	0	0	0	0	113	3	12	44	20	2	11	0	0
39:	MF39	0	0	0	9	14	0	12	0	6	0	0	0	0	129	4	12	18	10	4	0	6	0
40:	MF40	0	0	0	11	24	0	13	0	5	0	0	0	0	197	3	23	89	28	5	2	2	0
41:	SC41	0	0	0	142	45	0	58	0	4	0	0	0	0	709	10	63	952	199	198	9	0	0
42:	SC42	0	0	0	13	18	0	19	0	1	0	0	0	0	104	1	17	109	24	3	9	0	0
43:	SC43	0	0	0	52	10	0	17	0	1	0	0	0	0	234	4	16	352	60	224	0	0	0
44:	SC44	0	0	0	47	5	0	8	0	1	0	0	0	0	192	4	15	217	45	132	0	0	0
45:	SC45	0	0	0	50	12	0	15	0	1	0	0	0	0	199	1	15	274	70	339	0	0	0
46:	AC46	0	0	0	7	4	0	8	0	2	0	0	0	0	289	4	7	17	7	2	1	0	0
47:	AC47	0	0	0	2	2	0	3	0	0	0	0	0	0	94	3	7	13	6	1	0	0	0
48:	AC48	0	0	0	30	5	0	27	0	1	0	0	0	0	131	4	29	60	29	1	2	0	0
49:	AC49	0	4	2	44	37	0	47	0	5	5	2	0	0	634	24	249	286	48	69	3	0	0
50:	AC50	0	0	0	20	29	0	25	0	5	2	1	0	0	193	2	45	101	32	16	3	0	0
51:	AC51	0	0	0	5	2	0	4	0	0	1	0	0	0	128	1	40	39	4	9	0	0	0
52:	AC52	0	0	0	1	0	0	0	0	0	0	0	0	0	42	0	10	8	0	2	0	0	0
53:	AC53	0	4	2	9	2	0	10	0	0	0	1	0	0	107	19	84	68	4	26	0	0	0
54:	CA54	0	0	0	19	4	0	14	0	1	0	1	0	0	107	6	19	67	26	3	2	0	0
55:	CA55	0	9	0	44	46	0	43	0	6	3	2	2	3	1039	109	540	506	70	193	6	2	0
56:	CA56	0	0	0	26	24	0	19	0	5	0	2	0	3	208	39	47	89	27	23	3	0	0
57:	CA57	0	0	0	6	16	0	15	0	1	0	0	2	0	225	13	107	198	19	64	3	2	0

Figure III.13.3

UNCLASSIFIED***EXAMPLE OF OUTPUT OF UTILITY TOTAL/UNITS***UNCLASSIFIED

1	:L197	2
2	:L199	1
3	:L2A1	1
4	:L2A2	1
5	:L383	1
6	:L2A3	1
7	:L427	4
8	:SC51	1
9	:SC58	1
10	:SC52	1
11	:SC53	1
12	:SC54	1
13	:SC55	1
14	:SC56	1
15	:SC35	4
16	:SC36	4
17	:SC37	5
18	:SC38	4
19	:TB11	7
20	:TC11	28
21	:TP11	84
22	:MF16	4
23	:MC17	8
24	:ME17	24
25	:MT17	8
26	:RC06	8
27	:RB39	4
28	:ML34	4
29	:MP34	12
30	:MI34	4
31	:ML72	1
32	:L193	1
33	:L207	4
34	:AH47	1
35	:AP47	2
36	:AT47	2
37	:AD79	1
38	:AD80	1
39	:AD81	2
40	:AW19	4
41	:L291	1
42	:CP41	1
43	:L492	8
44	:CS93	1
45	:L494	1
46	:L495	1
47	:L496	1
48	:MS12	4
49	:MS13	4
50	:MS14	4
51	:MS15	4
52	:RW33	4
53	:CH30	4
54	:CH59	1
55	:CH60	1
56	:CH58	1
57	:AD46	2

Figure III.13.4

```
UNCLASSIFIED***EXAMPLE OF OUTPUT OF UTILITY TOTAL/CATEGORY**

 1:        0
 2:      166
 3:        0
 4:     3457
 5:     4060
 6:        0
 7:     1333
 8:      342
 9:      259
10:       50
11:       28
12:      253
13:       71
14:     3093
15:     4296
16:      855
17:     3667
18:     1049
19:    78483
20:      750
21:        0
22:        3
```

Figure III.13.5

UNCLASSIFIED***EXAMPLE OF THE OUTPUT DATA OF UTILITY WIMP/TOTAL-CAT*

1:	0
2:	336
3:	251
4:	0
5:	1051
6:	718
7:	0
8:	952
9:	6
10:	120
11:	70
12:	37
13:	175
14:	123
15:	25316
16:	2914
17:	10642
18:	14101
19:	1736
20:	3835
21:	91
22:	57
23:	0

Figure III.13.5A

CHAPTER 14

UTILITY - SEARCH/ENGAGEREP

14.1 DESCRIPTION - The purpose of this utility is to determine the fraction of time spent by the U.S. Force in each of the four combat postures in each of the seven time periods of the study. The 8 combat postures played by the CEM are converted to the 4 played by the MPP. The four combat postures are Attack, Defense Intense (Defend), Delay and Defense Light (Inactive). The seven time periods of the study are

PERIODS

	1	2	3	4	5	6	7
DAYS	1-15	16-30	31-60	61-90	91-120	121-150	151-180

In order to determine this fraction of time the utility uses as its only input, the Engagement Report which was produced by the Concepts Evaluation Model (CEM) theater simulator. This file may either be found on magentic tape or on mass storage. Depending on the location of the file, a different runstream will be used to execute the utility.

The output from this utility will be a mass storage file "SCENARIO-XX" which will be used as input to the following utility, "CONTROL/COMPILER."

14.2 STRUCTURE - Figure III.14.1 presents the overall structure of this utility.

14.3 DATA BASE - The data base which is used to support this utility consists of two files; one input file and one output file. The input file is the Engagement Report which was produced by the CEM. This file details the amount of time spent by allied forces in various combat missions during various time periods of the conflict. It should be emphasized that this file contains data not only on U.S. forces; but also NATO and other non-U.S. forces. The output portion of the data base from this utility is the SCENARIO/XX file. This file presents summary for the U.S. forces, for the seven time periods of the study, the percent of the time the U.S. force spent in one of the four combat postures; i.e.c, Attack, Defend, Delay or Inactive. This file will serve as one of the five input files to the following utility, "CONTROL/COMPILER."

14.4 RUNSTREAM - This utility is different from others in that it has two runstreams that can be executed depending on whether or not the input file for the utility, ENGAGEREP, is activeon the public mass storage device or has been inactivated and placed on magnetic tape.

If the ENGAGEREP file is active and resident on the public pack the runstream under the element name SEARCH/ENGAGEREP-1 (Figure III.14.2) is executed. If the file is inactive and resides on magnetic tape

then the runstream SEARCH/ENGAGEREP-2, Figure III.14.2A, must be executed. In either case, both runstreams are cataloged under the program file name CSTART*82XQT.

As these runstreams execute they perform the following functions:

- Allocate to logical unit 88 the program file of the current study; in this instance SECRET*82WARFP88. They further require the user to provide the proper password to gain access to the program file.

- If the ENGAGEREP is inactive and on magnetic tape, then the runstream (Figure III.14.3) will require the user to:

  Replace the "XXXX" on line 5 of the runstream with the proper tape number of the CEM output which can be obtained from the CEM Operator/Analyst. With the proper tape identified, the runstreams will allocate a temporary file "82TAPE" which will facilitate the reading of the tape.

The magnetic tape will probably contain other files besides the ENGAGEREP file. Therefore, Line 12 of the runstream will instruct the system to skip past the first "X" number of files on the tape in order to position the tape reader at the beginning of the file. The "X" must be replaced by the proper number of files which precede the ENGAGEREP file on the tape. This information also can be obtained from the CEM Operator/Analyst.

- The next 4 statements (Lines 17-20) will:

  Allocate a temporary file to logical unit 7;

  Copy the contents of ENGAGEREP to file 7;

  Rewind the tape; and

  Release the temporary file 82 tape.

- If the file ENGAGEREP is active, then the runstream will require the user to do nothing. Logical unit 7 will be allocated and the contents of the active file assigned to it.

- In either case, the next step will be to execute the utility.

- The results of the processing will then be copied to the permanent file SCENARIO/XX and cataloged under the study's program file. The "XX" portin of the element name must be changed to reflect the CEM Run Control Number which can be obtained from the CEM Operator/Analyst.

- Release the resources allocated to this utility.

14.5 INPUT - The SEARCH/ENGAGEREP utility has one input file, the ENGAGEREP. This file is an output of the Concept Evaluation Model (CEM) which is a high resolution theater simulation model. The ENGAGEREP will contain information on not only U.S. forces but NATO and other non-U.S. forces. Therefore, one of the functions of this utility is to screen out all data which does not pertain to the U.S. force.

The file is composed of three basic record formats. The first record format identifies that portion of the total force and the particular day being analyzed. The second record format details the total time spent by the Blue forces in one of the 9 details the total time spent by the Blue forces in on eof the 9 combat missions during this specific time period; i.e., 15 days. The third record type specifies the fraction of time spent by U.S. forces during this time period; i.e. 15 days. The third record type specifies the fraction of time spent by U.S. forces during this time period in one of the four combat postures; i.e., Attack, Defense Intense (Defend), Delay or Defense Light (Inactive).

As was noted earlier in paragraph 14.4, if the ENGAGEREP file is currently active, it will be found on the public mass storage device under the current study's program file using the element name "ENGAGEREP." If the file has been inactivated. It can be found on magnetic tape. The proper tape number and location on the tape can be obtained from the CEM Operator/Analyst.

The following give the record layouts for the file. Because of the voluminous quantity of the ENGAGEREP sample data, no sample data is provided here.

FILE: ENGAGEREP

STORAGE MEDIUM: Mass Storage

SOURCE: CEM

RECORD FORMAT:

Position	Description	Format
1-8	Blanks	8X
9-14	Allied Force ID (1)	A6
15-20	Allied Force ID (2)	A6
21-26	Allied Force ID (3)	A6
27-30	Blank	44X
71-74	Number of the day of study	I4

8 Blank Records

1-69	Blank	69X
70-88	Total time spent by Blue Units attacking Red in hastily prepared positions	F18.1
1-69	Blank	69X
70-88	Total time spent by Blue Units attacking Red in prepared position	F18.1
1-69	Blank	69X
70-88	Total time spent by Blue Units attacking Red units in Delay	F18.1
1-69	Blank	69X
70-88	Total time spent by Blue Units in chance meeting with Red units	F18.1
1-69	Blank	69X
70-88	Total time spent by Blue Units in hastily prepared positions while Red attacks	F18.1
1-69	Blank	69X
70-88	Total time spent by Blue Units in prepared positions while Red attacks	F18.1
1-69	Blank	69X
70-88	Total time spent by Blue Units in Delay while Red units attack	F18.1
1-69	Blank	69X
70-88	Total time spent by Blue Units in a Static State	F18.1
1-69	Blank	69X
70-88	Total time spent by Blue Units in Reserve	F18.1

6 skipped records

1-95	Blank	95X
96-113	Fraction of the total time spent by Blue Units in Attack posture	F18.3

1-95	Blank	95X
96-113	Fraction of the total time spent by Blue Units in Defend posture	F18.3
1-95	Blank	95X
96-113	Fraction of the total time spent by Blue Units in Delay posture	F18.3
1-95	Blank	95X
96-113	Fraction of the total time spent by Blue Units in Inactive Posture	F18.3

14.6 OUTPUT - This utility produces one file as output called the SCENARIO/XX. THE "XX" portion of this name will be changed to reflect the appropriate CEM run control number as provided by the CEM Operator/Analyst. The SCENARIO/XX file will be used as one of the five input files to the CONTROL/COMPILER utility which follows:

The SCENARIO/XX file will contain information which describes the total time spent by U.S. forces in each of the nine combat missions and the fraction of the total time spent by U.S. forces in each of the nine combat missions and the fraction of the total time spent in each of the four combat postures. This information is provided for each of the seven time periods in the study. (It should be noted that the capability does exist to express this information for an additional 3 time periods.)

The SCENARIO/XX file uses 3 record formats to identify and describe each of the seven basic time periods in the study and the distribution of the total time U.S. forces spent within each of the various nine combat missions and the fraction of the total time spent within each of the four combat postures. The file further summarizes, at the end of the file, the fraction of time spent in each of the four combat postures for ten time periods.

Figure III.14.4 presents the SCENARIO/XX example data in the file.

FILE: SCENARIO/XX
STORAGE MEDIUM: Mass Storage
SOURCE: UTILITY - SEARCH/ENGAGEREP

RECORD FORMATS:

Position	Description	Format
	RECORD A	
1	Blank	1X
2 - 8	'ICYCLE -'	-
9 - 12	Time Cycle Period	I4

13 22	Blanks	10X
23 - 28	Allied Force ID (1)	A6
29 - 34	Allied Force ID (2)	A6
35 - 40	Allied Force ID (3)	A6

RECORD B*

1 - 25	Blanks	25X
26-32	Total amount of time spent by U.S. units in a specific mission	F7.1
1 - 40	Blank	40X
41 - 48	Fraction of the total time spent by U.S. forces in one of the 4 Combat postures	F8.3

RECORD C**

1	'I'	1H1
2 - 5	Blanks	4X
6 - 11	'ATTACK'	-
12 - 15	Blanks	4X
16 - 21	(DEFENSE INTENSE)	-
22 - 26	Blanks	5X
27 - 31	'DELAY'	-
32 - 33	Blanks	2X
34 - 41	(DEFENSE LIGHT)	-

RECORD D

1 - 10	Blanks	10X
11 - 17	'15 DAYS'	-

* This record will occur 9 times; once for each of the 9 combat missions.

** This record will occur 4 times; once for each of the 4 combat postures.

RECORD E***

1	Blank	1X
2 - 41	The fraction of time spent by U.S. forces in each of the four combat postures in each of the first 2 15-day periods of the study.	4(F10.4)

Skip 4 records

RECORD F

1	Blank	1X
2 - 8	'30 days'	-
1	Blank	1X
2 - 41	The fraction of time spent by U.S. forces in each of the 4 combat postures in each 6 30-day periods of the study.	4(F10.4)

Skip 4 records

RECORD G

1	Blank	1X
2 - 8	'90 days'	-
1	Blank	1X
2 - 41	The fraction of time spent by U.S. forces in each of the 4 combat postures in each of the 2 90-day periods of the study.	4(F10.4)

*** This record will occur twice.

SEARCH/ENGAGEREP STRUCTURE

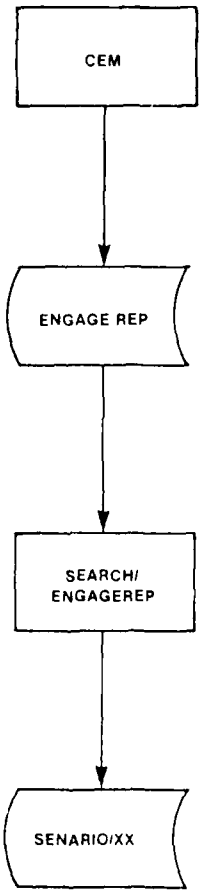


Figure III.14.1

UNCLASSIFIED ***FILE NAME:CSTANT*82XGT ELEMENT NAME:SEARCH/ENGAGEREP-1

```
@MSG,N  THIS RUN STREAM IS DESIGNED FOR USE ONLY WHEN
@MSG,N  THE CEM DATA FILE "ENGAGEREP" IS ACTIVE (ON PUBLIC PACK/FILES).
@USE 88.,SECRET*82WAREP88.
@ASG,A 88/       /     .
@ASG,A 77ENGAGEREP.
@USE 7.,77ENGAGEREP.
@MSG,N  THE ABOVE DATA FILE "77ENGAGEREP" IS PRODUCED
@MSG,N  BY THE CEM.  FROM THE FILE THIS UTILITY WILL
@MSG,N  EXTRACT THE NECESSARY DATA TO CREAT THE CEM
@MSG,N  SCENARIO (FRACTION OF TIME SPENT BY US FORCES IN
@MSG,N  EACH OF THE FOUR COMBAT POSTURE OVER THE SEVEN TIME
@MSG,N  PERIODS OF THE SIMULATION).
@ASG,T 2.
@ASG,A 32XGT.
@XQT 32XGT.SEARCH/ENGAGEREP
@ED  2.,88.SCENARIO/XX
P 20
LAST
EXIT
@MSG,N  THE ABOVE ELEMENT FILE "SCENARIO/XX" CONTAINS THE
@MSG,N  OUTPUT DATA FROM THIS UTILITY.  THE "XX" AT THE
@MSG,N  END OF THE ELEMENT NAME WILL WILL BE CHANGED WITH
@MSG,N  EVERY EXECUTION OF THIS RUN STREAM AND SHOULD
@MSG,N  MATCH THE CEM RUN CONTROL NUMBER.
@FREE 2.
@FREE 7.
@FREE 88.
```

Figure III.14.2

```
...CLASSIFIED***FILE NAME:COSTART•82XQT  ELEMENT NAME:SEARCH/ENGACRER-2

  1:&MS  ,N  THIS RUN STREAM IS DESIGNED FOR USE WHEN THE CEM DATA
  2:&MS  ,N  FILE "ENGACRER" IS INACTIVE AND STORED ON TAPE.
  3:USER  88,,SECRET•82WARE88.
  4:ACC  ,A  88/    /   .
  5:ASG  ,T  82TAPE,,900,XXXXR
  6:&MS  ,N  THE ABOVE TEMPORARY FILE "82TAPE" IS CREATED TO FACILITATE
  7:&MS  ,N  READING OF THE CEM RUN OUTPUT TAPE. THE
  8:&MS  ,N  "XXXX" IN THE ABOVE STATEMENT SHOULD BE REPLACED WITH
  9:&MS  ,N  TAPE NUMBER OF THE CEM OUTPUT TAPE OF INTEREST.
 10:&MS  ,N  THIS NUMBER MUST BE OBTAINED FROM THE CEM OPERATOR/
 11:&MS  ,N  ANALYST.
 12:&MVE  ,TAPE,,X
 13:&MS  ,N  THE ABOVE STATEMENT WILL MOVE THE TAPE READER PAST
 14:&MS  ,N  UNWANTED FILES TO THE "ENGACRER" DATA FILE.  THE "X" IN THE
 15:&MS  ,N  ABOVE STATEMENT SHOULD BE REPLACED WITH THE NUMBER
 16:&M  ,N  OF FILES THAT NEED TO BE BY-PASSED.
 17:ASG  ,T 7.,///1000
 18:COPY,C  ,82TAPE,,7.
 19:REWIND  ,82TAPE.
 20:FREE  ,82TAPE.
 21:ASG  ,T 2.
 22:ASG  ,A  82XQT.
 23:XQT  ,82XQT.SEARCH/ENGACRER
 24:EOF  ,2.,R,,SCENARIO/XX
 25:EOF  ,D
 26:REWIND
 27:XXX
  1:&MS  ,N  THE ABOVE ELEMENT "SCENARIO/XXX" CONTAINS THE
  2:&MS  ,N  "XXXX" DATA FROM THIS UTILITY.  THE "XX" MUST BE RE-
  3:&MS  ,N  PLACED PRIOR TO THE EXECUTION OF THIS RUN STREAM
  4:&MS  ,N  WITH THE APPROPRIATE CEM RUN CONTROL NUMBER.
  5:REWIND  ,2.
  6:REWIND  ,7.
  7:ATTACH  ,99.
```

Figure III.14.2A

```
UNCLASSIFIED***EXAMPLE OF THE OUTPUT FROM UTILITY SEARCH/ENGAGEREP***UNCLASSIFIE

  1: ICYCLE =   1            BLUE PARTITION 1
  2: ICYCLE =   2            BLUE PARTITION 1
  3: ICYCLE =   3            BLUE PARTITION 1
  4: ICYCLE =   4            BLUE PARTITION 1
  5: ICYCLE =   5            BLUE PARTITION 1
  6: ICYCLE =   6            BLUE PARTITION 1
  7: ICYCLE =   7            BLUE PARTITION 1
  8: ICYCLE =   8            BLUE PARTITION 1
  9: ICYCLE =   9            BLUE PARTITION 1
 10: ICYCLE =  10            BLUE PARTITION 1
 11: ICYCLE =  11            BLUE PARTITION 1
 12: ICYCLE =  12            BLUE PARTITION 1
 13: ICYCLE =  13            BLUE PARTITION 1
 14: ICYCLE =  14            BLUE PARTITION 1
 15: ICYCLE =  15            BLUE PARTITION 1
 16:                              .0
 17:                              .0
 18:                              .0
 19:                              .0
 20:                          243.7
 21:                          338.2
 22:                           39.6
 23:                         2570.6
 24:                          202.0
 25:                                          .000
 26:                                          .171
 27:                                          .012
 28:                                          .817
 29: ICYCLE =  16            BLUE PARTITION 1
 30: ICYCLE =  17            BLUE PARTITION 1
 31: ICYCLE =  18            BLUE PARTITION 1
 32: ICYCLE =  19            BLUE PARTITION 1
 33: ICYCLE =  20            BLUE PARTITION 1
 34: ICYCLE =  21            BLUE PARTITION 1
 35: ICYCLE =  22            BLUE PARTITION 1
 36: ICYCLE =  23            BLUE PARTITION 1
 37: ICYCLE =  24            BLUE PARTITION 1
 38: ICYCLE =  25            BLUE PARTITION 1
 39: ICYCLE =  26            BLUE PARTITION 1
 40: ICYCLE =  27            BLUE PARTITION 1
 41: ICYCLE =  28            BLUE PARTITION 1
 42: ICYCLE =  29            BLUE PARTITION 1
 43: ICYCLE =  30            BLUE PARTITION 1
 44:                          213.3
 45:                          339.5
 46:                          286.3
 47:                           30.3
 48:                          475.3
 49:                          644.0
 50:                           70.7
 51:                         5314.4
 52:                          457.0
 53:                                          .109
 54:                                          .145
 55:                                          .009
 56:                                          .737
 57: ICYCLE =  31            BLUE PARTITION 1
```

Figure III.14.3

```
 58: ICYCLE =  32            BLUE PARTITION 1
 59: ICYCLE =  33            BLUE PARTITION 1
 60: ICYCLE =  34            BLUE PARTITION 1
 61: ICYCLE =  35            BLUE PARTITION 1
 62: ICYCLE =  36            BLUE PARTITION 1
 63: ICYCLE =  37            BLUE PARTITION 1
 64: ICYCLE =  38            BLUE PARTITION 1
 65: ICYCLE =  39            BLUE PARTITION 1
 66: ICYCLE =  40            BLUE PARTITION 1
 67: ICYCLE =  41            BLUE PARTITION 1
 68: ICYCLE =  42            BLUE PARTITION 1
 69: ICYCLE =  43            BLUE PARTITION 1
 70: ICYCLE =  44            BLUE PARTITION 1
 71: ICYCLE =  45            BLUE PARTITION 1
 72: ICYCLE =  46            BLUE PARTITION 1
 73: ICYCLE =  47            BLUE PARTITION 1
 74: ICYCLE =  48            BLUE PARTITION 1
 75: ICYCLE =  49            BLUE PARTITION 1
 76: ICYCLE =  50            BLUE PARTITION 1
 77: ICYCLE =  51            BLUE PARTITION 1
 78: ICYCLE =  52            BLUE PARTITION 1
 79: ICYCLE =  53            BLUE PARTITION 1
 80: ICYCLE =  54            BLUE PARTITION 1
 81: ICYCLE =  55            BLUE PARTITION 1
 82: ICYCLE =  56            BLUE PARTITION 1
 83: ICYCLE =  57            BLUE PARTITION 1
 84: ICYCLE =  58            BLUE PARTITION 1
 85: ICYCLE =  59            BLUE PARTITION 1
 86: ICYCLE =  60            BLUE PARTITION 1
 87:                            630.5
 88:                           1419.0
 89:                           1110.5
 90:                            132.1
 91:                           1055.5
 92:                           1623.6
 93:                             164.2
 94:                           1491 3.6
 95:                           1270.0
 96:                                                .146
 97:                                                .123
 98:                                                .007
 99:                                                .724
100: ICYCLE =  61            BLUE PARTITION 1
101: ICYCLE =  62            BLUE PARTITION 1
102: ICYCLE =  63            BLUE PARTITION 1
103: ICYCLE =  64            BLUE PARTITION 1
104: ICYCLE =  65            BLUE PARTITION 1
105: ICYCLE =  66            BLUE PARTITION 1
106: ICYCLE =  67            BLUE PARTITION 1
107: ICYCLE =  68            BLUE PARTITION 1
108: ICYCLE =  69            BLUE PARTITION 1
109: ICYCLE =  70            BLUE PARTITION 1
110: ICYCLE =  71            BLUE PARTITION 1
111: ICYCLE =  72            BLUE PARTITION 1
112: ICYCLE =  73            BLUE PARTITION 1
113: ICYCLE =  74            BLUE PARTITION 1
114: ICYCLE =  75            BLUE PARTITION 1
```

Figure III.14.3 (cont.)

```
UNCLASSIFIED***EXAMPLE OF THE OUTPUT FROM UTILITY SEARCH/ENGAGEREP***UNCLASSIFIE

115: IC YCLE =  76              BLUE PARTITION 1
116: IC YCLE =  77              BLUE PARTITION 1
117: IC YCLE =  78              BLUE PARTITION 1
118: IC YCLE =  79              BLUE PARTITION 1
119: IC YCLE =  80              BLUE PARTITION 1
120: IC YCLE =  81              BLUE PARTITION 1
121: IC YCLE =  82              BLUE PARTITION 1
122: IC YCLE =  83              BLUE PARTITION 1
123: IC YCLE =  84              BLUE PARTITION 1
124: IC YCLE =  85              BLUE PARTITION 1
125: IC YCLE =  86              BLUE PARTITION 1
126: IC YCLE =  87              BLUE PARTITION 1
127: IC YCLE =  88              BLUE PARTITION 1
128: IC YCLE =  89              BLUE PARTITION 1
129: IC YCLE =  90              BLUE PARTITION 1
130:                              1146.8
131:                              2987.2
132:                              2046.2
133:                               207.8
134:                              1197.0
135:                              2467.7
136:                               226.6
137:                             2829.7
138:                              2066.0
139:                                                  .153
140:                                                  .093
141:                                                  .006
142:                                                  .749
143: IC YCLE =  91              BLUE PARTITION 1
144: IC YCLE =  92              BLUE PARTITION 1
145: IC YCLE =  93              BLUE PARTITION 1
146: IC YCLE =  94              BLUE PARTITION 1
147: IC YCLE =  95              BLUE PARTITION 1
148: IC YCLE =  96              BLUE PARTITION 1
149: IC YCLE =  97              BLUE PARTITION 1
150: IC YCLE =  98              BLUE PARTITION 1
151: IC YCLE =  99              BLUE PARTITION 1
152: IC YCLE = 100              BLUE PARTITION 1
153: IC YCLE = 101              BLUE PARTITION 1
154: IC YCLE = 102              BLUE PARTITION 1
155: IC YCLE = 103              BLUE PARTITION 1
156: IC YCLE = 104              BLUE PARTITION 1
157: IC YCLE = 105              BLUE PARTITION 1
158: IC YCLE = 106              BLUE PARTITION 1
159: IC YCLE = 107              BLUE PARTITION 1
160: IC YCLE = 108              BLUE PARTITION 1
161: IC YCLE = 109              BLUE PARTITION 1
162: IC YCLE = 110              BLUE PARTITION 1
163: IC YCLE = 111              BLUE PARTITION 1
164: IC YCLE = 112              BLUE PARTITION 1
165: IC YCLE = 113              BLUE PARTITION 1
166: IC YCLE = 114              BLUE PARTITION 1
167: IC YCLE = 115              BLUE PARTITION 1
168: IC YCLE = 116              BLUE PARTITION 1
169: IC YCLE = 117              BLUE PARTITION 1
170: IC YCLE = 118              BLUE PARTITION 1
171: IC YCLE = 119              BLUE PARTITION 1
```

Figure III.14.3 (cont.)

```
UNCLASSIFIED***EXAMPLE OF THE OUTPUT FROM UTILITY SEARCH/ENGAGEREP***UNCLASSIFIE

172:  ICYCLE = 120            BLUE PARTITION 1
173:                            130 0.9
174:                            402 2.7
175:                            251 1.2
176:                             21 2.4
177:                            132 5.6
178:                            335 3.4
179:                             57 2.5
180:                           4271 2.6
181:                            277 3.0
182:                                                .135
183:                                                .091
184:                                                .010
185:                                                .774
186:  ICYCLE = 121            BLUE PARTITION 1
187:  ICYCLE = 122            BLUE PARTITION 1
188:  ICYCLE = 123            BLUE PARTITION 1
189:  ICYCLE = 124            BLUE PARTITION 1
190:  ICYCLE = 125            BLUE PARTITION 1
191:  ICYCLE = 126            BLUE PARTITION 1
192:  ICYCLE = 127            BLUE PARTITION 1
193:  ICYCLE = 128            BLUE PARTITION 1
194:  ICYCLE = 129            BLUE PARTITION 1
195:  ICYCLE = 130            BLUE PARTITION 1
196:  ICYCLE = 131            BLUE PARTITION 1
197:  ICYCLE = 132            BLUE PARTITION 1
198:  ICYCLE = 133            BLUE PARTITION 1
199:  ICYCLE = 134            BLUE PARTITION 1
200:  ICYCLE = 135            BLUE PARTITION 1
201:  ICYCLE = 136            BLUE PARTITION 1
202:  ICYCLE = 137            BLUE PARTITION 1
203:  ICYCLE = 138            BLUE PARTITION 1
204:  ICYCLE = 139            BLUE PARTITION 1
205:  ICYCLE = 140            BLUE PARTITION 1
206:  ICYCLE = 141            BLUE PARTITION 1
207:  ICYCLE = 142            BLUE PARTITION 1
208:  ICYCLE = 143            BLUE PARTITION 1
209:  ICYCLE = 144            BLUE PARTITION 1
210:  ICYCLE = 145            BLUE PARTITION 1
211:  ICYCLE = 146            BLUE PARTITION 1
212:  ICYCLE = 147            BLUE PARTITION 1
213:  ICYCLE = 148            BLUE PARTITION 1
214:  ICYCLE = 149            BLUE PARTITION 1
215:  ICYCLE = 150            BLUE PARTITION 1
216:                            218 3.8
217:                            639 0.7
218:                            445 9.3
219:                             22 7.2
220:                            133 7.0
221:                            355 5.6
222:                             58 2.3
223:                           5442 0.1
224:                            387 9.0
225:                                                .171
226:                                                .055
227:                                                .003
228:                                                .757
```

Figure III.14.3 (cont.)

```
229: IC YCLE = 151          BLUE PARTITION 1
230: IC YCLE = 152          BLUE PARTITION 1
231: IC YCLE = 153          BLUE PARTITION 1
232: IC YCLE = 154          BLUE PARTITION 1
233: IC YCLE = 155          BLUE PARTITION 1
234: IC YCLE = 156          BLUE PARTITION 1
235: IC YCLE = 157          BLUE PARTITION 1
236: IC YCLE = 158          BLUE PARTITION 1
237: IC YCLE = 159          BLUE PARTITION 1
238: IC YCLE = 160          BLUE PARTITION 1
239: IC YCLE = 161          BLUE PARTITION 1
240: IC YCLE = 162          BLUE PARTITION 1
241: IC YCLE = 163          BLUE PARTITION 1
242: IC YCLE = 164          BLUE PARTITION 1
243: IC YCLE = 165          BLUE PARTITION 1
244: IC YCLE = 166          BLUE PARTITION 1
245: IC YCLE = 167          BLUE PARTITION 1
246: IC YCLE = 168          BLUE PARTITION 1
247: IC YCLE = 169          BLUE PARTITION 1
248: IC YCLE = 170          BLUE PARTITION 1
249: IC YCLE = 171          BLUE PARTITION 1
250: IC YCLE = 172          BLUE PARTITION 1
251: IC YCLE = 173          BLUE PARTITION 1
252: IC YCLE = 174          BLUE PARTITION 1
253: IC YCLE = 175          BLUE PARTITION 1
254: IC YCLE = 176          BLUE PARTITION 1
255: IC YCLE = 177          BLUE PARTITION 1
256: IC YCLE = 178          BLUE PARTITION 1
257: IC YCLE = 179          BLUE PARTITION 1
258: IC YCLE = 180          BLUE PARTITION 1
259:                          2970.0
260:                          7597.2
261:                          4716.5
262:                           233.2
263:                          1378.9
264:                          3641.9
265:                           589.5
266:                          7002.7
267:                          4563.0
268:                                                  .157
269:                                                  .054
270:                                                  .006
271:                                                  .783
272:1     ATTACK     DEFEND      DELAY   INACTIVE
273:              15 DAYS
274:       .0000      .1810      .0320      .7870
275:       .2926      .0246      .1070      .5757
276:
277:
278:
279:
280: 30 DAYS
281:       .2030      .2490      .1090      .4370
282:       .2665      .2708      .0004      .5163
283:       .2600      .1563      .0004      .5502
284:       .1963      .1557      .1190      .5290
285:       .3849      .1121      .0105      .4924
286:       .2016      .1050      .1004      .4930
287:
288:
289:
290:
291: 90 DAYS
292:       .2530      .1930      .1060      .4480
293:       .2609      .1243      .1066      .4082
```

Figure III.14.3 (cont.)

CHAPTER 15
Utility - CEM/DATA

15.1 DESCRIPTION - The purpose of this utility is to produce the CEM/-DATA file which details, time period by time period, equipment authorization levels and loss rates for each specific item equipment type within the four major classifications of combat equipment, i.e., tanks, armored personnel carriers (APC), helicoptors, and antitank/mortar weapons (ATM). This data is, in turn, used as input to the following utility, CEM/LOSS.

This utility and the following CEM/LOSS, are unique within the Materiel Postprocessor in that they share and are executed from the same runstream, entitled CEM/LOSSES, which is cataloged as an element under the program file CSTART*82XQT. the output file from the CEM/DATA is used immediately as input to the CEM/LOSSES and is released immediately. Only the output from CEM/LOSSES is permanently cataloged. Therefore, if processing is interrupted at any point in the running of this series of utilities, both must be rerun.

15.2 STRUCTURE - Figure III.15.1 displays the overall structure of the utility.

15.3 DATA BASE - The data base which supports this utility consists of two mass storage files, one serving as input and the other as output. The input file has been created specifically for the WARF from the LOG Report processor of the CEM. This file essentially specifies the major items of equipment in the study, their levels of authorization and loss rates. Four major items, (i.e., tanks, APC's, helicoptors and ATM's of which individual model types may be specified, for example the M-1 tank.

Using this file as its input the CEM/DATA utility will produce the CEM/LOSSES 1 file as its sole output. This file will provide a period by period summary of the average authorization levels and loss percentages for each specific model of each of the four major equipment types. The time periods are here, for the first time, broken into two major categories. The fist 90 days are referred to as the INTENSIVE PERIOD; the second 90 days are called the SUSTAINING PERIOD. This file will be used as the sole input file to the follwoing utility CEM/-LOSSES.

15.4 RUNSTREAM - The runstream which controls the execution of this utility also controls the execution of the following utility CEM/LOSSES. Therefore, it will be described once. The runstream is displayed in Figure III.15.2. As the runstream executes it accomplishes the following functions:

- o Assigns the program file for the current study to the unit 88 for further processing. In the current example the current study's

program file is SECRET*82WARF88. It further requires the user to supply the proper password to get access to the system.

- Assigns to logical unit 7 the CEM data report, which was prepared exclusively for WARF from the CEM LOG REPORT. In the current example the file 73AMP88-XX is used as this input file. The proper file name and CEM run control number, which replaces the "XX" portion of the file name, must be obtained from the CEM OPERATOR/ANALYST prior to the execution of the utility.

- Instead of explicitly establishing an output file and assigning it a logical unit number as was done in previous utilities, this utility accomplishes much the same functions but uses a different tact. In line 18 of the runstream a breakpoint is set, the PRINT file is activated and output file 82CEMLOSS 1 is identified. This action will allow the utility to write its output to the system default print file, logical unit 6 and automatically have it directed to the interim file for temporary storage. All data written to the print file during this time before the closing Breakpoint statement, Line 25, will be treated in this manner.

- The utility is executed.

- As the message in lines 21-24 notes, the utility will read the number entered in line 20 on columns 39-40 using the system default logical unit 5. This figure denotes the number of 4-day theater cycles that will be played in the current study. This figure will also be used to calculate the number of division cycles, and corps cycles. In the current study 45, 4 day (i.e., 180 days) increments are used.

- Line 25 closes the Breakpoint.

- Unit 7 is released.

- At this point the interim file CEM/LOSS has been created and is immediately assigned to logical unit 7 to be used as input to the next utility, CEM/LOSSES.

- Logical unit 8 is assigned as the output file.

- The utility CEM/LOSSES is executed. This utility is cataloged as an element under the program file 82XQT.

- As in the utility above this utility will read data in directly from the RUNSTREAM. These data elements allow the user to identify and limit those weapon numbers of WARF Major Items of Equipment, a maximum of 49 major weapon systems may be identified.

- The contents of the logical unit file 8 are copied to the permanent file CEM/LOSSES-XX, or the "XX" portion must be changed by the

user to reflect the appropriate CEM run control number. This number can be obtained from the CEM Operator/Analyst.

- o Allocated units are relased.

15.5 INPUT - There is only one input file for this utility. It is the CEM/-DATA report file which is produced exclusively for the WARF from the CEM LOG REPORT (LOGREP). The file should be cataloged as an element under the current study's program file, in this present case SECRET*S2WARF88, using the element name CEM/DATA.

The file details the number of items of equipment authorized and the CEM loss rates for up to 12 individual models of four major items of combat equipment. The four major items of combat equipment are tanks, armored personnel carriers (APC), helicopters and antitank & mortar weapons (ATM). An example of one of the 12 individual models of one of these major combat items would be the XM1 Model Tank.

The following details the file layout for the CEM Data Record file.

FILE: CEM DATA REPORT (73AMP88-XX)
STORAGE MEDIUM: Mass Storage
SOURCE: CEM LOG REPORT

RECORD FORMAT:

Column	Description	Format
1-80	TANKS - Authorized number and loss rates for the first four models.	8F10.4
1-80	TANKS - Authorized number and loss rates for the second four models.	8F10.4
1-80	TANKS - Authorized number and loss rates for the final four models	8F10.4
1-80	APC's - Authorized number and loss rates for the first four models.	8F10.4
1-80	APC's - Authorized number and loss rates for the second four models.	8F10.4
1-80	APC's - Authorized number and loss rates for the final four models	8F10.4
1-80	HELICOPTERS - Authorized number and loss rates for the first four models	8F10.4
1-80	HELICOPTERS - Authorized number and loss rates for the second four models	8F10.4
1-80	HELICOPTERS - Authorized number	8F10.4

	and loss rates for the final four models	
1-80	ATM - Authorized number and loss rates for the first four models	8F10.4
1-80	ATM - Authorized number and loss rates for the second four models	8F10.4
1-80	ATM - Authorized number and loss rates for the final four models.	8F10.4

15.6 OUTPUT - This utility produces one output file, CEMLOSS1. This file details for each of the equipment model types (a maximum of 12) within the four major Combat equipment categories, (i.e., tanks, APC's helicopters and ATM's) the average number of items authorized for a specific time period and the percentage loss rate for that period.

As can be seen, the utility has taken the input order of battle data and accumulated into several time periods of the battle. These time periods are further classified into the Intensive Period and Sustaining Period of the battle. The Intensive Period is the first 90 days and the sustaining Period is the last 90 days.

The file, pictured in Figure III.15.3 is highly formatted in order that it can be humanly read as a report for data verification before it is used as an input file to the following utility CEM/LOSSES. As a result the file is self explanatory and the record layout is not necessary.

The file is unique in that it is the only file within the system that is not permanently saved; it is read immediately by the following utility CEM/LOSSES. Thus if processing is interrupted in either of these two utilities, both will have to be rerun.

13.7 PERFORMANCE - The utility requires the following system resources to be allocated:

CORE:	10 K OR LESS
CPU TIME:	5 MIN OR LESS
CLOCK TIME:	10 MIN OR LESS
DISK UNITS:	1 - 2
COMMENTS:	NONE

CEM/DATA STRUCTURE

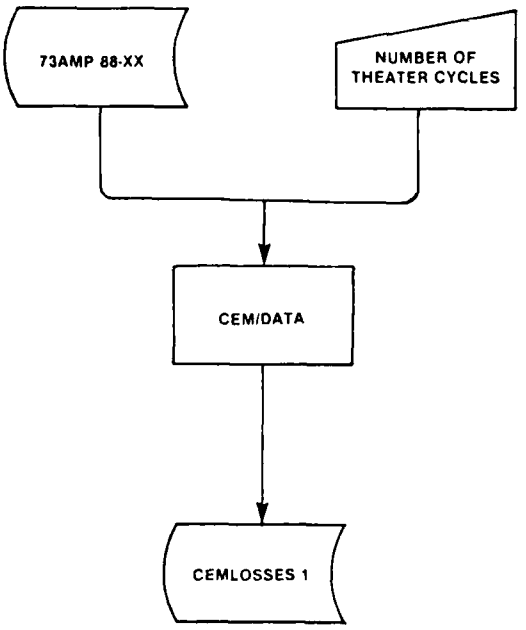


Figure III.15.1

```
/* CLASSIFICATION***FILE NAME:COSTART*82XQT  ELEMENT NAME:CEM/LOSSES***UNCLASSIFIED

  1:&USE 99.*SECRET*82WARFP88.
  2:&ASG,A 86/    /   .
  3:&ASG,T 7.
  4:&ASG,A 73AMP88-XX.
  5:&MSG,N  THE ABOVE DATA FILE "73AMP88-XX" IS CREATED BY
  6:&MSG,N  CEM SPECIFICLY FOR WARF.  THE FILE CONTAINS DATA
  7:&MSG,N  ON LOSSES OF WARF MIE PLAYED IN CEM.  THE "XX"
  8:&MSG,N  MUST BE CHANGED PRIOR TO THE EXECUTION OF THIS
  9:&MSG,N  RUN STREAM TO MATCH THE APPROPPIATE CEM RUN CONTROL
 10:&MSG,N  NUMBER OF INTEREST.  THIS NUMBER CAN BE OBTAINED FROM
 11:&MSG,N  THE CEM OPERATOR/ANALYST.
 12:&LD   73AMP88-XX.,7.
 13:EXIT
 14:&ASG,UF 82CEMLOSS1.
 15:&MSG,N  THE ABOVE TEMPORARY DATA FILE "82CEMLOSS1" WILL
 16:&MSG,N  CONTAIN THE OUTPUT OF THE UTILITY "82XQT.CEM/DATA" AND
 17:&MSG,N  AND SERVE AS INPUT TO THE UTILITY "82XQT.CEM/LOSSES".
 18:&PERMIT PRINT$/82CEMLOSS1
 19:&XQT 82XQT.CEM/DATA
 20:                                    45
 21:&MSG,N  THE ABOVE NUMBER "45" IS REQUIRED IN COLUMNS 39-40.
 22:&MSG,N  THIS NUMBER REFLECTS THE NUMBER OF THEATER CYCLES BEING
 23:&MSG,N  PLAYED IN THE CEM. ONE CEM THEATER CYCLE IS EQUIVALENT TO
 24:&MSG,N  FOUR DAYS (45 X 4 = 180 DAYS).
 25:&PERMIT PRINT$
 26:&FREE 7.
 27:&USE 7.,82CEMLOSS1.
 28:&ASG,T 8.
 29:&XQT 82XQT.CEM/LOSSES
 30:01
 31:02
 32:03
 33:04
 34:13
 35:15
 36:25
 37:28
 38:32
 39:&END
 40:&MSG,N  THE ABOVE LIST OF NUMBER CORRESPOND TO THE CEM WEAPON
 41:&MSG,N  NUMBERS OF WARF MIE UPON WHICH CEM LOSS RATES ARE
 42:&MSG,N  DESIRED.  THE CEM PLAYS UP TO 49 MAJOR WEAPON SYSTEMS.
 43:&ID   88.,88.CEM/LOSSES-XX
 44:20
 45:&ASGT
 46:EXIT
 47:&MSG,N  THE ABOVE ELEMENT FILE "CEM/LOSSES-XX" CONTAINS THE OUTPUT
 48:&MSG,N  OF THE UTILITY.  THE "XX" MUST CORRESPOND TO THE APPROPRIATE
 49:&MSG,N  CEM RUN CONTROL NUMBER.
 50:&FREE 7.
 51:&FREE 8.
 52:&FREE 88.
```

Figure III.15.2

UNCLASSIFIED***EXAMPLE OF CEMLOSS1 OUTPUT DATA FROM UTILITY CEM/DATA

```
 1: NUMBER OF 30-DAY BLOCKS OF DATA =     6
 2:
 3:
 4:
 5:                                AVERAGE 15-DAY LOSS RATES **D-1 TO D-15**                    INTENSE PERIOD
 6:
 7:
 8:
 9: EQUIP TYPE        1        2        3        4        5        6        7        8        9       10       11       12
10: AVG TK  AUTH 1769.40 1838.00      .00   324.00      .00      .00      .00      .00      .00      .00      .00      .00
11: PCT TK  LOSS     .32      .07      .00      .05    12.39    58.56     4.65   348.47   135.66    58.35     7.15    27.08
12:
13:
14: AVG APC AUTH 1297.53 2519.07 1244.00      .00      .00      .00      .00      .00      .00      .00      .00      .00
15: PCT APC LOSS     .12      .11      .18    13.17     1.35     7.97    13.10   126.84    36.76   225.75   217.27     9.53
16:
17:
18: AVG MEL AUTH  235.40      .00      .00    12.60   180.00
19: PCT MEL LOSS     .36     3.72    55.97      .75      .39
20:
21:
22: AVG ATM AUTH  492.73   572.87  2241.53      .00      .00      .00      .00      .00      .00      .00      .00      .00
23: PCT ATM LOSS     .00      .00      .09      .00    92.62   147.30   326.03    25.58      .00      .00      .00      .00
24:
25:
26:
27:
28:                               AVERAGE 15-DAY LOSS RATES **D-16 TO D-30**                    INTENSE PERIOD
29:
30:
31:
32: EQUIP TYPE        1        2        3        4        5        6        7        8        9       10       11       12
33: AVG TK  AUTH 1481.33 2058.00    43.20   324.00      .00      .00      .00      .00      .00      .00      .00      .00
34: PCT TK  LOSS     .28      .07      .61      .16     5.42     9.98    34.60   102.00    70.93    26.13    47.82    13.72
35:
36:
37: AVG APC AUTH 1486.60 2730.67  1628.00      .00      .00      .00      .00      .00      .00      .00      .00      .00
38: PCT APC LOSS     .17      .12      .28     7.53     2.06     8.29    93.24    58.41    14.75   149.91   110.82    77.73
39:
40:
41: AVG MEL AUTH  411.40      .00      .00    14.20   204.00
42: PCT MEL LOSS     .30    12.68     8.70      .42      .21
43:
44:
45: AVG ATM AUTH  941.53   634.73  3251.13   129.60      .00      .00      .00      .00      .00      .00      .00      .00
46: PCT ATM LOSS     .00      .00      .09      .06    38.72    54.12   105.59    11.38      .00      .00      .00      .00
47:
48:
49:
50:
51:                               AVERAGE 30-DAY LOSS RATES **D-1 TO D-30**                     INTENSE PERIOD
52:
53:
54:
55: EQUIP TYPE        1        2        3        4        5        6        7        8        9       10       11       12
56: AVG TK  AUTH 1425.67 1948.00    21.60   324.00      .00      .00      .00      .00      .00      .00      .00      .00
57: PCT TK  LOSS     .60      .13     1.21      .15      .00      .00      .00      .00      .00      .00      .00      .00
```

Figure III.15.3

UNCLASSIFIED***EXAMPLE OF CFMLOSS1 OUTPUT DATA FROM UTILITY CFM/DATA

AVG AFC AUTH	1392.07	2624.87	1436.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
PCT AFC LOSS	.29	.22	.45	.00	.00	.00	.00	.00	.00	.00	.00	.00
AVG HEL AUTH	323.40	.00	.00	13.40	192.00							
PCT HEL LOSS	.65	.00	.00	1.15	.59							
AVG ATM AUTH	867.13	603.90	2746.33	64.80	.00	.00	.00	.00	.00	.00	.00	.00
PCT ATM LOSS	.00	.00	.18	.13	.00	.00	.00	.00	.00	.00	.00	.00

AVERAGE 30-DAY LOSS RATES **0-1 TO 0-60** INTENSE PERIOD

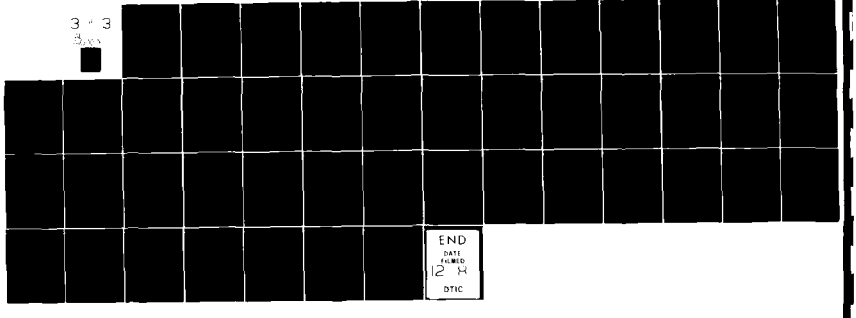
FLOID TYPE	1	2	3	4	5	6	7	8	9	10	11	12
AVG [illegible] AUTH	2424.13	2003.00	37.80	324.00	.00	.00	.00	.00	.00	.00	.00	.00
PCT [illegible] LOSS	.93	.11	.86	.15	.00	.00	.00	.00	.00	.00	.00	.00
AVG AFC AUTH	1535.07	3509.33	2103.33	.00	.00	.00	.00	.00	.00	.00	.00	.00
PCT AFC LOSS	.26	.19	.90	.00	.00	.00	.00	.00	.00	.00	.00	.00
AVG [illegible] AUTH	473.40	.00	.00	18.03	216.00							
PCT HEL LOSS	.41	.00	.00	.80	.39							
AVG ATM AUTH	1175.07	786.90	4162.10	113.40	.00	.00	.00	.00	.00	.00	.00	.00
PCT ATM LOSS	.00	.00	.17	.10	.00	.00	.00	.00	.00	.00	.00	.00

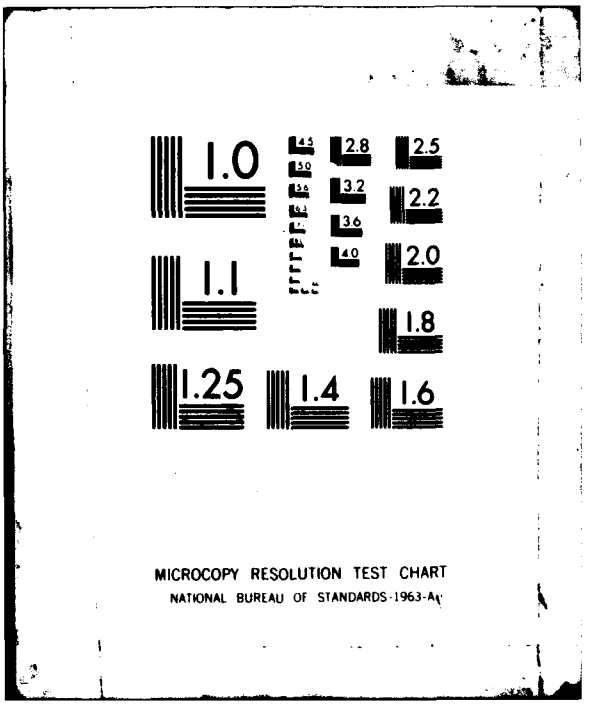
AVERAGE 30-DAY LOSS RATES **0-1 TO 0-30** INTENSE PERIOD

FLOID TYPE	1	2	3	4	5	6	7	8	9	10	11	12
AVG [illegible] AUTH	2184.53	2021.33	43.20	324.00	.00	.00	.00	.00	.00	.00	.00	.00
PCT [illegible] LOSS	.40	.09	.50	.12	.00	.00	.00	.00	.00	.00	.00	.00
AVG AFC AUTH	1813.87	4171.41	2981.67	.00	.00	.00	.00	.00	.00	.00	.00	.00
PCT AFC LOSS	.27	.19	.33	.00	.00	.00	.00	.00	.00	.00	.00	.00
AVG HEL AUTH	554.40	.00	.00	21.81	224.00							
PCT HEL LOSS	.31	.00	.00	.55	.27							
AVG ATM AUTH	1478.18	974.80	5191.62	129.60	.00	.00	.00	.00	.00	.00	.00	.00

Figure III.15.3 (cont.)

AD-A107 076 CACI INC-FEDERAL ARLINGTON VA F/G 15/7
WARTIME REQUIREMENTS FOR AMMUNITION MATERIEL AND PERSONNEL (WAR--ETC(U)
AUG 81 S CANTLON, R G RHOADES MDA903-80-D-0668
UNCLASSIFIED CAA-D-81-2 NL




1.0
1.1
1.25
1.4
1.6
1.8
2.0
2.2
2.5
2.8
3.2
3.6
4.0
MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

```
115: PCT ATM LOSS      .00      .00      .14      .07      .00      .00      .00      .00      .00      .00      .00      .00
116:
117:
118:
119:
120:                                AVG 30-DAY LOSS RATES **D-91 TO D-120**                    SUSTAINING PERIOD
121:
122:
123:
124: EQUIP TYPE        1        2        3        4        5        6        7        8        9       10       11       12
125: AVG TK   AUTH 4768.00 2058.00    54.00   324.00      .00      .00      .00      .00      .00      .00      .00      .00
126: PCT TK   LOSS     .19      .04      .00      .05      .00      .00      .00      .00      .00      .00      .00      .00
127:
128:
129: AVG APC AUTH 2190.00 5526.00 3587.00      .00      .00      .00      .00      .00      .00      .00      .00      .00
130: PCT APC LOSS     .13      .07      .16      .00      .00      .00      .00      .00      .00      .00      .00      .00
131:
132:
133: AVG HEL AUTH  797.00      .00      .00    29.50   240.00
134: PCT HEL LOSS     .04      .00      .00      .16      .05
135:
136:
137: AVG ATM AUTH 2174.00 1204.00 7306.00   162.00      .00      .00      .00      .00      .00      .00      .00      .00
138: PCT ATM LOSS      .00      .00      .06      .01      .00      .00      .00      .00      .00      .00      .00      .00
139:
140:
141:
142:
143:                                AVG 30-DAY LOSS RATES **D-91 TO D-150**                    SUSTAINING PERIOD
144:
145:
146:
147: EQUIP TYPE        1        2        3        4        5        6        7        8        9       10       11       12
148: AVG TK   AUTH 4768.00 2058.00    54.00   324.00      .00      .00      .00      .00      .00      .00      .00      .00
149: PCT TK   LOSS     .24      .04      .37      .05      .00      .00      .00      .00      .00      .00      .00      .00
150:
151:
152: AVG APC AUTH 2190.00 5526.00 3587.00      .00      .00      .00      .00      .00      .00      .00      .00      .00
153: PCT APC LOSS     .13      .09      .24      .00      .00      .00      .00      .00      .00      .00      .00      .00
154:
155:
156: AVG HEL AUTH  797.00      .00      .00    29.50   240.00
157: PCT HEL LOSS     .04      .00      .00      .14      .03
158:
159:
160: AVG ATM AUTH 2174.00 1204.00 7306.00   162.00      .00      .00      .00      .00      .00      .00      .00      .00
161: PCT ATM LOSS      .00      .00      .05      .01      .00      .00      .00      .00      .00      .00      .00      .00
162:
163:
164:
165:
166:                                AVG 30-DAY LOSS RATES **D-91 TO D-180**                    SUSTAINING PERIOD
167:
168:
169:
170: EQUIP TYPE        1        2        3        4        5        6        7        8        9       10       11       12
171: AVG TK   AUTH 4768.00 2058.00    54.00   324.00      .00      .00      .00      .00      .00      .00      .00      .00
```

Figure III.15.3 (cont.)

UNCLASSIFIED***EXAMPLE OF CEMLOSS1 OUTPUT DATA FROM UTILITY CEM/DATA

```
172: PCT TK  LOSS      .22      .03      .82      .04      .00      .00      .00      .00      .00      .00      .00      .00
173:
174:
175: AVG APC AUTH 2190.00 5526.00 3587.00      .00      .00      .00      .00      .00      .00      .00      .00      .00
176: PCT APC LOSS      .11      .08      .21      .00      .00      .00      .00      .00      .00      .00      .00      .00
177:
178:
179: AVG HEL AUTH  797.00      .00      .00    29.50   240.00
180: PCT HEL LOSS      .03      .00      .00      .11      .03
181:
182:
183: AVG ATM AUTH 2174.00 1204.00 7306.00   162.00      .00      .00      .00      .00      .00      .00      .00      .00
184: PCT ATM LOSS      .00      .00      .04      .00      .00      .00      .00      .00      .00      .00      .00      .00
185:
186:
187:
188:
189:            **** FOLLOWING DATA FOR EACH 30-DAY PERIOD
190:
191:
192:
193:                              30-DAY LOSS RATE ** D-1 TO D-30**
194:
195:
196: AVG TANK AUTH 1425.67 1948.00   21.60   324.00      .00      .00      .00      .00      .00      .00      .00      .00
197: TOT TANK LOSS  855.66  262.49   26.20    47.49    17.81    68.55    39.15   450.47   206.59    85.08    54.97    40.30
198: CT TANK LOSS      .60      .13     1.21      .15      .00      .00      .00      .00      .00      .00      .00      .00
199:
200:
201: AVG APC AUTH 1392.07 2624.87 1436.00      .00      .00      .00      .00      .00      .00      .00      .00      .00
202: TOT APC LOSS  407.43  587.07  648.69    20.70     3.41    16.25   102.34   185.05    51.61   374.96   328.09    87.26
203: PCT APC LOSS      .29      .22      .45      .00      .00      .00      .00      .00      .00      .00      .00      .00
204:
205:
206: AVG HELO AUTH  323.40      .00      .00    13.40   192.00
207: TOT HELO LOSS  209.77    15.96    64.67    15.40   113.53
208: PCT HELO LOSS      .65      .00      .00     1.15      .59
209:
210:
211: AVG ATM AUTH  667.13  603.80 2746.33    64.80      .00      .00      .00      .00      .00      .00      .00      .00
212: TOT ATM LOSS      .00      .00  487.52     8.21   131.34   201.42   431.62    36.96      .00      .00      .00      .00
213: PCT ATM LOSS      .00      .00      .18      .13      .00      .00      .00      .00      .00      .00      .00      .00
214:
215:
216:                              30-DAY LOSS RATE ** D-31 TO D-60**
217:
218:
219: AVG TANK AUTH 3422.60 2058.00    54.00   324.00      .00      .00      .00      .00      .00      .00      .00      .00
220: TOT TANK LOSS 1716.18  185.18    39.06    48.47     7.00    77.88    65.90   213.71    58.76    32.30    75.05    28.70
221: CT TANK LOSS      .50      .09      .72      .15      .00      .00      .00      .00      .00      .00      .00      .00
222:
223:
224: AVG APC AUTH 1878.00 4394.87 2771.87      .00      .00      .00      .00      .00      .00      .00      .00      .00
225: TOT APC LOSS  441.56  772.03 1036.54    22.38     3.19    15.72   161.92   120.78    69.87   178.15   162.50   114.50
226: PCT APC LOSS      .24      .18      .37      .00      .00      .00      .00      .00      .00      .00      .00      .00
227:
228:
```

Figure III.15.3 (cont.)

UNCLASSIFIED•••EXAMPLE OF CEMLOSS1 OUTPUT DATA FROM UTILITY CEM/DATA

```
229: AVG HELO AUTH  635.80     .00     .00   22.67  240.00
230: TOT HELO LOSS  180.78   18.92   15.97   13.48   54.72
231: PCT HELO LOSS      .28     .00     .00     .59     .23
232:
233:
234: AVG ATM AUTH 1603.00  969.20 5577.87  162.00     .00     .00     .00     .00     .00     .00     .00     .00
235: TOT ATM LOSS     .00     .00  966.29   14.84   69.18   54.91  412.93   32.93     .00     .00     .00     .00
236: PCT ATM LOSS     .00     .00     .17     .09     .00     .00     .00     .00     .00     .00     .00     .00
237:
238:
239:                              30-DAY LOSS RATE •• D-61 TO D-90••
240:
241:
242: AVG TANK AUTH 4739.00 2058.00   54.00  324.00     .00     .00     .00     .00     .00     .00     .00     .00
243: TOT TANK LOSS 1294.76  111.14     .00   20.80    3.52   52.05   40.05   83.42   29.18   24.01   38.50   14.58
244: CT TANK LOSS      .27     .05     .00     .06     .00     .00     .00     .00     .00     .00     .00     .00
245:
246:
247: AVG APC AUTH 2182.80 5502.00 3573.13     .00     .00     .00     .00     .00     .00     .00     .00     .00
248: TOT APC LOSS  389.60  542.12  900.34   17.72    2.97   13.24  120.94   67.20   53.43  137.58   85.84   73.45
249: PCT APC LOSS      .18     .10     .25     .00     .00     .00     .00     .00     .00     .00     .00     .00
250:
251:
252: AVG HELO AUTH  794.07     .00     .00   29.37  240.00
253: TOT HELO LOSS   76.01    7.41    7.41    6.81   14.47
254: PCT HELO LOSS      .10     .00     .00     .23     .06
255:
256:
257: AVG ATM AUTH 2164.40 1199.00 7274.67  162.00     .00     .00     .00     .00     .00     .00     .00     .00
258: TOT ATM LOSS     .00     .00  736.94    3.44   45.70   20.88  281.98   21.15     .00     .00     .00     .00
259: PCT ATM LOSS     .00     .00     .10     .02     .00     .00     .00     .00     .00     .00     .00     .00
260:
261:
262:                              30-DAY LOSS RATE •• D-91 TO D-120••
263:
264:
265: AVG TANK AUTH 4768.00 2058.00   54.00  324.00     .00     .00     .00     .00     .00     .00     .00     .00
266: TOT TANK LOSS  903.57   91.53     .00   15.54    4.38   39.36   33.14   54.83   16.46   20.71   37.97   25.53
267: CT TANK LOSS      .19     .04     .00     .05     .00     .00     .00     .00     .00     .00     .00     .00
268:
269:
270: AVG APC AUTH 2190.00 5526.00 3587.00     .00     .00     .00     .00     .00     .00     .00     .00     .00
271: TOT APC LOSS  275.80  383.49  569.40   28.89    8.67   21.96  122.72   78.56   55.10  140.65   66.46   70.99
272: PCT APC LOSS      .13     .07     .16     .00     .00     .00     .00     .00     .00     .00     .00     .00
273:
274:
275: AVG HELO AUTH  797.00     .00     .00   29.50  240.00
276: TOT HELO LOSS   33.41    6.28    4.87    4.58   13.18
277: PCT HELO LOSS      .04     .00     .00     .16     .05
278:
279:
280: AVG ATM AUTH 2174.00 1204.00 7306.00  162.00     .00     .00     .00     .00     .00     .00     .00     .00
281: TOT ATM LOSS     .00     .00  460.13    2.09   50.70   57.70  363.58   16.48     .00     .00     .00     .00
282: PCT ATM LOSS     .00     .00     .06     .01     .00     .00     .00     .00     .00     .00     .00     .00
283:
284:
285:                              30-DAY LOSS RATE •• D-121 TO D-150••
```

Figure III.15.3 (cont.)

UNCLASSIFIED•••EXAMPLE OF CEMLOSS1 OUTPUT DATA FROM UTILITY CEM/DATA

```
296:
297:
298: AVG TANK AUTH 4768.00 2058.00   54.00  324.00     .00     .00     .00     .00     .00     .00     .00     .00
299: TOT TANK LOSS 1409.95   70.78   39.36   14.20    3.20   27.68   32.29   39.00   24.62   18.12   32.03   11.43
300: CT TANK LOSS      .30     .03     .74     .04     .00     .00     .00     .00     .00     .00     .00     .00
301:
302:
303: AVG APC AUTH 2190.00 5526.00 3587.00     .00     .00     .00     .00     .00     .00     .00     .00     .00
304: TOT APC LOSS  314.70  577.90 1185.64   17.20    2.57   10.72  132.57   86.45   36.46  109.14   66.16   78.46
305: PCT APC LOSS      .14     .10     .33     .00     .00     .00     .00     .00     .00     .00     .00     .00
306:
307:
308: AVG HELO AUTH  797.00     .00     .00   29.50  240.00
309: TOT HELO LOSS   23.18    5.86    4.46    3.67    3.33
310: PCT HELO LOSS      .03     .00     .00     .12     .01
311:
312:
313: AVG ATM AUTH 2174.00 1204.00 7306.00  162.00     .00     .00     .00     .00     .00     .00     .00     .00
314: TOT ATM LOSS      .00     .00  316.86     .00   23.45    8.32  120.77    8.05     .00     .00     .00     .00
315: PCT ATM LOSS      .00     .00     .04     .00     .00     .00     .00     .00     .00     .00     .00     .00
316:
317:
318:                              30-DAY LOSS RATE •• D-151 TO D-180••
319:
320:
321: AVG TANK AUTH 4768.00 2058.00   54.00  324.00     .00     .00     .00     .00     .00     .00     .00     .00
322: TOT TANK LOSS  801.24   21.05   92.65    9.18    3.85   25.02    6.26   24.04   23.74   19.43    7.34   12.79
323: CT TANK LOSS      .17     .01    1.72     .03     .00     .00     .00     .00     .00     .00     .00     .00
324:
325:
326: AVG APC AUTH 2190.00 5526.00 3587.00     .00     .00     .00     .00     .00     .00     .00     .00     .00
327: TOT APC LOSS  144.03  285.13  522.34   13.73    2.13   11.08   36.48   72.68   25.20  127.87   50.34   29.56
328: PCT APC LOSS      .07     .05     .15     .00     .00     .00     .00     .00     .00     .00     .00     .00
329:
330:
331: AVG HELO AUTH  797.00     .00     .00   29.50  240.00
332: TOT HELO LOSS   11.34    1.12    3.20    1.37    1.95
333: PCT HELO LOSS      .01     .00     .00     .05     .01
334:
335:
336: AVG ATM AUTH 2174.00 1204.00 7306.00  162.00     .00     .00     .00     .00     .00     .00     .00     .00
337: TOT ATM LOSS      .00     .00   45.87     .14   12.28    5.55   63.01    3.56     .00     .00     .00     .00
338: PCT ATM LOSS      .00     .00     .01     .00     .00     .00     .00     .00     .00     .00     .00     .00
339:
340:
341:@MSG.N  THE ABOVE NUMBER "45" IS REQUIRED IN COLUMNS 39-40.
342:@MSG.N  THIS NUMBER REFLECTS THE NUMBER OF THEATER CYCLES BEING
343:@MSG.N  PLAYED IN THE CEM. ONE CEM THEATER CYCLE IS EQUIVALENT TO
344:@MSG.N  FOUR DAYS (45 X 4 = 180 DAYS).
345:@BRKPT PRINTS
```

Figure III.15.3 (cont.)

CHAPTER 16
Utility - CEM/LOSSES

16.1 DESCRIPTION - The purpose of this module is to produce the CEM/LOSSES file which will be used later as input to the CONTROL/COMPILER utility. This utility will use as its primary input the 82CEMLOSS1 file which was produced by the preceding utility, CEM/DATA. Further, it also requires the user to provide a list of specific CEM weapon control numbers identifying equipment models for which CEM loss rates are needed. Using this information the utility will read the 82CEMLOSS1 file and screen out unneeded data such as the authorization levels, and produce a summary of the CEM/LOSS rates for all models of equipment in the study, further it will select the loss rates for those models identified by the user in the runstream and write a summary line of these loss rates and express them as percentages.

16.2 STRUCTURE - Figure III.16.1 presents the overall organization of the utility.

16.3 DATA BASE - The data base which supports this utility is composed of two major files; one input and one output. The input file is the 82CEMLOSS1 file which was produced by the CEM/DATA utility. This file is an interim file which will not be cataloged under the study's program file and will be lost after this runstream is executed. Therefore, if the current utility, CEM/LOSSES, fails to complete its execution, the CEM/DATA and the CEM/LOSSES utilities must be run again. Since they are both executed using the same runstream this should not cause a serious problem. The only output from this utility is the CEM/LOSSES file. This file will be cataloged under the current program file, in this case SECRET*82WARFP88 and be used as input to a following utility CONTROL/COMPILER.

16.4 RUNSTREAM - This utility is executed in the same runstream as the previous utility CEM/DATA (Figure 14.2). After executing the CEM/DATA utility and producing the 83CEMLOSS1 interim file, the runstream sets up for the CEM/LOSSES utility. In so doing, it:

- o Allocates logical unit 7 and assigns the temporary file 82CEMLOSS1 to the unit.
- o Executes the CEM/LOSSES utility.
- o CEM/LOSSES requires the user to identify for it the combat equipment models for which it will prepare and produce special output records in the CEM/LOSSES file. The user will be required to enter the 2 character CEM Weapon Numbers, one code per line, between the utility execution statement and the EOF statement in the runstream (Figure III.16.2, Lines 34 and 44, respectively). Figure III.16.3 presents an example list of CEM Weapon numbers and their explanations. The list of CEM Weapon numbers will change from study to study. These are provided by the CEM operator/analyst. A maximum of 22 models can presently be handled within the utility without modification to the utility.

- o The output file is copied from logical unit 8 to the permanent file file. The "XX" portion of the file name must be changed to reflect the CEM Control number being used. This number can be obtained from the CEM Operator/Analyst.

- o Allocated units are released.

16.5 INPUT - The major input to this utility is the 82CEMLOSS1 file which was produced by the previous utility CEM/DATA. This file summarizes information received from the CEM LOG report as to the authorized number and loss rates for up to 12 individual models of four major types of combat equipment, i.e., tanks, APC's, helicopters and ATM's. It accumulates this information by the various time periods of the study.

Figure III.15.4 (previous chapter) presents an example of the data found in the file, since the file is produced in a report-like format which is rather self-explanatory.

Also used as input to this utility is a list of two character CEM Weapon Numbers which controls the output of loss rates which is produced. This list is entered into the runstream of the utility. Figure III.16.3 lists these numbers and provides an explanation.

16.6 OUTPUT - The CEM/LOSSES utility produces the CEM/LOSSES file as its single output. This file will be used as one of the input files to a subsequent utility, CONTROL/COMPILER. The file itself is quite similar in appearance to the 82CEMLOSS1 file in that it summarizes over a number of time periods information concerning loss rate to up to 12 models of four major types of combat equipment, i.e., tanks, APC's, helicopters and ATM's. Further, it is formatted in such a manner that it is quite readable by itself. But the file is unique in that it does not contain any authorization levels for the equipment, only loss rates. Further, the last line or record of each time period is entitled "RO9CEM" or "R10CEM" denotes the loss rates for those items explicitly entered by the user in the runstream. See Figure III.16.4.

FILE: CEM/LOSSES
STORAGE MEDIUM: Mass Storage
SOURCE: Utility - CEM/LOSSES

RECORD FORMAT:

Position	Description	Format
Record 1:		
1-4	Number of days in the period	I4
5-8	First day in the period	I4

9-12	Last day in the period. (If last day = 120, 150 or 180, the zero is dropped)	I4
Record 2:		
1-72	Period titling information	12(A6)
Record 3:		
1-9	Blank	9X
10-105	Tanks - fraction lost within time period for each specific model of tank(a max of 12 models)	12(F8.2)
Record 4:		
1-9	Blank	9X
10-105	APC-fraction lost within time period for each specific model of APC (a max of 12 models)	12(F8.2)
Record 5:		
1-9	Blank	9X
10-105	HELICOPTERS-fraction lost within time period for each specific model of Helicopter. (Presently a max of 5 models allowed)	4(F8.2)

Record 6:

1-9	Blanks	9X
10-105	ATM-fraction lost within this time period for each specific model of ATM (a max of 12 models is allowed)	12(F8.2)

Record 7:

1-13	"RO9CEM____01-"	--
14-15	The number of individual CEM weapon control numbers as specified in the runstream	I2
16-104	The percentage loss rate for the specific model of equipment specified by the user in the CEM/LOSSES runstream.(A maximum of 22 individual models is presently provided for in the model. It should also be noted that for the first two time periods (i.e., days 1-15 and 16-30), these loss rates are doubled.	13(F7.4)

16.7 PERFORMANCE - The following system resources will be required to execute this utility:

CORE:	10K OR LESS
CPU TIME:	2 MIN OR LESS
CLOCK TIME:	10 MIN OR LESS
DISK UNITS:	1 - 2
COMMENTS:	NONE

CEM/LOSSES STRUCTURE

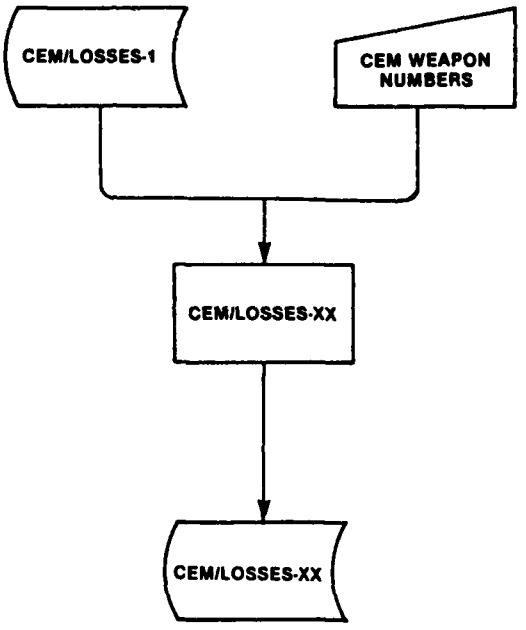


Figure III.16.1

```
UNCLASSIFIED***FILE NAME:CSTART*82XQT  ELEMENT NAME:CEM/LOSSES***UNCLASSIFIED

 1:@USE 88.,SECRET*82WARFP88.
 2:@ASG,A 88/    /   .
 3:@ASG,T 7.
 4:@ASG,A 73AMP88-XX.
 5:@MSG,N  THE ABOVE DATA FILE "73AMP88-XX" IS CREATED BY
 6:@MSG,N  CEM SPECIFICLY FOR WARF.  THE FILE CONTAINS DATA
 7:@MSG,N  ON LOSSES OF WARF MIE PLAYED IN CEM.  THE "XX"
 8:@MSG,N  MUST BE CHANGED PRIOR TO THE EXECUTION OF THIS
 9:@MSG,N  RUN STREAM TO MATCH THE APPROPRIATE CEM RUN CONTROL
10:@MSG,N  NUMBER OF INTEREST.  THIS NUMBER CAN BE OBTAINED FROM
11:@MSG,N  THE CEM OPERATOR/ANALYST.
12:@ED  73AMP88-XX.,7.
13:EXIT
14:@ASG,UP 82CEMLOSS1.
15:@MSG,N  THE ABOVE TEMPORARY DATA FILE "82CEMLOSS1" WILL
16:@MSG,N  CONTAIN THE OUTPUT OF THE UTILITY "82XQT.CEM/DATA" AND
17:@MSG,N  AND SERVE AS INPUT TO THE UTILITY "82XQT.CEM/LOSSES".
18:@BRKPT PRINT$/82CEMLOSS1
19:@XQT 82XQT.CEM/DATA
20:                                    45
21:@MSG,N  THE ABOVE NUMBER "45" IS REQUIRED IN COLUMNS 39-40.
22:@MSG,N  THIS NUMBER REFLECTS THE NUMBER OF THEATER CYCLES BEING
23:@MSG,N  PLAYED IN THE CEM. ONE CEM THEATER CYCLE IS EQUIVALENT TO
24:@MSG,N  FOUR DAYS (45 X 4 = 180 DAYS).
25:@BRKPT PRINT$
26:@FREE 7.
27:@USE 7.,82CEMLOSS1.
28:@ASG,T 8.
29:@XQT 82XQT.CEM/LOSSES
30:01
31:02
32:03
33:04
34:13
35:15
36:25
37:29
38:32
39:@EOF
40:@MSG,N  THE ABOVE LIST OF NUMBER CORRESPOND TO THE CEM WEAPON
41:@MSG,N  NUMBERS OF WARF MIE UPON WHICH CEM LOSS RATES ARE
42:@MSG,N  DESIRED.  THE CEM PLAYS UP TO 49 MAJOR WEAPON SYSTEMS.
43:@ED  8.,88.CEM/LOSSES-XX
44:P 20
45:LAST
46:EXIT
47:@MSG,N  THE ABOVE ELEMENT FILE "CEM/LOSSES-XX" CONTAINS THE OUTPUT
48:@MSG,N  OF THE UTILITY.  THE "XX" MUST CORRESPOND TO THE APPROPRIATE
49:@MSG,N  CEM RUN CONTROL NUMBER.
50:@FREE 7.
51:@FREE 8.
52:@FREE AR.
```

Figure III.16.2

CEM WEAPON NUMBER LIST (EXAMPLE)

NUMBER	EXPLANATION
01	M1 Tank
02	M60A1 Tank
03	M551 Assault Vehicle
04	M48A3 Tank
13	IFV
15	M113A1 APC
25	AAH
29	AH-1S
32	Dragon

Figure III.16.3

```
UNCLASSIFIED***EXAMPLE OF THE OUTPUT FROM UTILITY CFM/LOSSES***UNCLASSIFIED

  1:  15   1  15
  2:                              AVERAGE 15-DAY LOSS RATES **D-1 TO D-15**
  3:                .32     .07     .00     .05   12.39   58.56    4.65  348.47  135.66   58.95    7.15   27.08
  4:                .12     .11     .18   13.17    1.35    7.97   13.10  126.64   36.76  225.05  217.27    9.53
  5:                .36    3.32   55.97     .75     .39
  6:                .00     .00     .09     .00   92.62  147.30  326.03   25.58     .00     .00     .00     .00
  7:RO9CEM     01- 9   64.0   14.0      .0   10.0   24.0   36.0   72.0   78.0   18.0
  8:
  9:
 10:
 11:
 12:
 13:
 14:  15  16  30
 15:                              AVERAGE 15-DAY LOSS RATES **D-16 TO D-30**
 16:                .28     .07     .61     .10    5.42    9.98   34.50  102.00   70.93   26.13   47.82   13.72
 17:                .17     .12     .26    7.53    2.06    8.29   89.24   58.41   14.75  149.91  110.82   77.73
 18:                .30   12.65    8.70     .42     .21
 19:                .00     .00     .09     .06   38.72   54.12  105.59   11.38     .00     .00     .00     .00
 20:RO9CEM     01- 9   56.0   14.0  122.0   20.0   34.0   52.0   60.0   42.0   18.0
 21:
 22:
 23:
 24:
 25:
 26:
 27:  30   1  30
 28:  30   1  60
 29:  30   1  90
 30:                              AVERAGE 30-DAY LOSS RATES **D-1 TO D-90**
 31:                .40     .09     .50     .12     .00     .00     .00     .00     .00     .00     .00     .00
 32:                .23     .15     .33     .00     .00     .00     .00     .00     .00     .00     .00     .00
 33:                .27     .00     .00     .55     .27
 34:                .00     .00     .14     .07     .00     .00     .00     .00     .00     .00     .00     .00
 35:RO9CEM     01- 9   40.0    9.0   50.0   12.0   23.0   33.0   27.0   27.0   14.0
 36:
 37:
 38:
 39:
 40:
 41:
 42:  30  91  12
 43:  30  91  15
 44:  30  91  18
 45:                              AVG 30-DAY LOSS RATES **D-91 TO D-180**
 46:                .22     .03     .82     .04     .00     .00     .00     .00     .00     .00     .00     .00
 47:                .11     .08     .21     .00     .00     .00     .00     .00     .00     .00     .00     .00
 48:                .03     .00     .00     .11     .03
 49:                .00     .00     .04     .00     .00     .00     .00     .00     .00     .00     .00     .00
 50:RO9CEM     01- 9   22.0    3.0   82.0    4.0   11.0   21.0    3.0    3.0    4.0
 51:
 52:
 53:
 54:
 55:
 56:
 57:                              30-DAY LOSS RATE ** D-1 TO D-30**
```

Figure III.16.4

```
UNCLASSIFIED***EXAMPLE OF THE OUTPUT FROM UTILITY CFM/LOSSES***UNCLASSIFIED

 58:              .60     .13    1.21     .15     .00     .00     .00     .00     .00     .00     .00     .00
 59:              .29     .22     .45     .00     .00     .00     .00     .00     .00     .00     .00     .00
 60:              .65     .00     .00    1.15     .59
 61:              .00     .00     .18     .13     .00     .00     .00     .00     .00     .00     .00     .00
 62:R09CEM    01- 9   60.0   13.0  121.0   15.0   29.0   45.0   65.0   59.0   18.0
 63:
 64:
 65:
 66:
 67:
 68:
 69:                                  30-DAY LOSS RATE ** D-31 TO D-60**
 70:              .50     .09     .72     .15     .00     .00     .00     .00     .00     .00     .00     .00
 71:              .24     .18     .37     .00     .00     .00     .00     .00     .00     .00     .00     .00
 72:              .78     .00     .00     .59     .23
 73:              .00     .00     .17     .09     .00     .00     .00     .00     .00     .00     .00     .00
 74:R09CEM    01- 9   50.0    9.0   72.0   15.0   24.0   37.0   28.0   23.0   17.0
 75:
 76:
 77:
 78:
 79:
 80:
 81:                                  30-DAY LOSS RATE ** D-61 TO D-90**
 82:              .27     .05     .00     .06     .00     .00     .00     .00     .00     .00     .00     .00
 83:              .18     .10     .25     .00     .00     .00     .00     .00     .00     .00     .00     .00
 84:              .10     .00     .00     .23     .06
 85:              .00     .00     .10     .02     .00     .00     .00     .00     .00     .00     .00     .00
 86:R09CEM    01- 9   27.0    5.0     .0    6.0   19.0   25.0   10.0    6.0   10.0
 87:
 88:
 89:
 90:
 91:
 92:
 93:                                  30-DAY LOSS RATE ** D-91 TO D-120**
 94:              .19     .04     .00     .05     .00     .00     .00     .00     .00     .00     .00     .00
 95:              .13     .07     .16     .00     .00     .00     .00     .00     .00     .00     .00     .00
 96:              .04     .00     .00     .16     .05
 97:              .00     .00     .06     .01     .00     .00     .00     .00     .00     .00     .00     .00
 98:R09CEM    01- 9   19.0    4.0     .0    5.0   13.0   16.0    4.0    5.0    6.0
 99:
100:
101:
102:
103:
104:
105:                                  30-DAY LOSS RATE ** D-121 TO D-150**
106:              .10     .03     .74     .04     .00     .00     .00     .00     .00     .00     .00     .00
107:              .14     .10     .33     .00     .00     .00     .00     .00     .00     .00     .00     .00
108:              .03     .00     .00     .12     .01
109:              .00     .00     .04     .00     .00     .00     .00     .00     .00     .00     .00     .00
110:R09CEM    01- 9   30.0    3.0   74.0    4.0   14.0   33.0    3.0    1.0    4.0
111:
112:
113:
114:
115:
116:
117:                                  30-DAY LOSS RATE ** D-151 TO D-180**
118:              .17     .01    1.72     .03     .00     .00     .00     .00     .00     .00     .00     .00
119:              .07     .05     .15     .00     .00     .00     .00     .00     .00     .00     .00     .00
120:              .01     .00     .00     .05     .01
121:              .00     .00     .01     .00     .00     .00     .00     .00     .00     .00     .00     .00
122:R09CEM    01- 9   17.0    1.0  172.0    3.0    7.0   15.0    1.0    1.0    1.0
123:
124:
125:
126:
127:
128:
```

Figure III.16.4 (cont'd.)

Chapter 17
Utility - COUNT/DIVISIONS

17.1 DESCRIPTION - The purpose of this utility is to produce the COUNT/DIVISIONS file. The COUNT/DIVISIONS file summarizes:

- o The number of divisions arriving in the theater period by period for the seven time periods of the analysis.
- o The average number of divisions arriving period by period.
- o The total number of U.S. divisions in theater on D-Day.
- o The average number of divisions in theater period by period.

The utility uses as its source of information the 73CEM5.BLUE/P88-XX file which is produced by CEM. This file provides information on each division participating in the theater conflict, such as its status and arrival date in theater.

In that the force structures, status and arrivals of divisions in the theater are relatively constant from each run of the CEM. This utility normally need only be run once during a study. The COUNT/DIVISIONS file will be used as one of the four input files into the following utility, CONTROL/COMPILER.

17.2 STRUCTURE -The overall structure of the utility is pictured in Figure III.17.1.

17.3 DATA BASE - The COUNT/DIVISIONS utility uses two files as its data base; one for input and one for output. The input file is the 73CEM5.BLUE/P88-XX file which is an input file to the CEM. This file describes divisions in theater and arriving in theater during the period of the study. Using this data the utility produces a short summary of divisional strengths and arrivals in the theater for the seven time periods of the study. This summary is written to the output file COUNT/DIVISIONS. This file is used as one of the four input files to the CONTROL/COMPILER utility which follows.

17.4 RUNSTREAM - The runstream which controls the execution is cataloged as an element under the program file CSTART*82XQT using the element name COUNT/DIVISIONS. The runstream is depicted in Figure III.17.2. As the runstream executes, it accomplishes the following functions:

- o Assigns to logical unit 88 the current study's program file; in this instance the program file is SECRET*82WARFP88.
- o Requires the user to provide the proper password to gain access to the file.

- o Assigns to logical unit 8 the CEM file which details the strengths and arrival rates of divisions into the theater. This file will be used as the input file to the utility. In the current example this file is cataloged as an element under the CEM program file called 73CEM5; and the file itself is called BLUE/P88-XX. In order to ensure the program file and element names are correct the user should check with the CEM Operator/Analyst.

- o Logical unit 7 is allocated to accumulate the output from the utility.

- o The utility is executed.

- o The contents of unit 7 are copied to the permanent file COUNT/DIVISIONS-XX and cataloged as an element under the current study's program file. The "XX" portion of the element name must be changed to correspond to the CEM input file control number, for example 73CEM5.BLUE/P88-XX.

- o Allocated resources are released.

17.5 INPUT - There is one input file to this utility. The file is an input to the CEM model and describes the relative sizes and arrivals of specific divisions in the theater. In the current example the file is cataloged as an element under the CEM program file 73CEM5 using the element name BLUE/P88-XX. The proper program file and element names can be obtained from the CEM Operator/Analyst. Record layout for the file is as follows:

FILE: 73CEM5.BLUE/P88-XX
STORAGE: Mass Storage
SOURCE: CEM

RECORD FORMAT:

Column	Description	Format
1 - 10	TITLE	A10
11 - 19	Division Name	A9
20 - 22	BLANK	3X
23 - 25	First Coordinates of FEBA Sector	I3
26 - 27	BLANK	2X
28 - 30	Second set of Coordinates FEBA Sector	I3
31 - 44	BLANK	19X
50	--	A1

51 - 71	BLANK	21X
72	Type of CEM partition	I1
1	BLANK	1X
2 - 6	TITLE	A5
7 - 10	BLANK	4X
11 - 12	Cycle=Number of 4-day periods in the CEM	I2
13 - 15	NUM	A3
16	BLANK	1X
17 - 18	First day of cycle of arriving units	I2
19	BLANK	1X
20	Code 1-used to check if a ghost A = ACTIVE 5A = GHOST	A1
21 - 22	Second day of the cycle of arriving units	I2

17.6 OUTPUT - This utility produces one output file referred to as COUNT/DIVISIONS-XX. The file will be cataloged as an element under the current study's program file (e.g., SECRET*82WARFP88). The file will contain a summary of:

- o The total number of divisions arriving in the theater time period by time period.
- o The average number of divisions arriving in the theater by period.
- o The total number of divisions in the theater on D-Day.
- o The average number of divisions in the theater by period. Figure III.17.3 presents an example of the data contained in the output file.

17.7 PERFORMANCE - This utility will require the following resouces to execute properly.

CORE:	5K OR LESS
CPU TIME:	3 MIN OR LESS
CLOCK TIME:	5 MIN OR LESS
DISK UNITS:	1 - 2
COMMENTS:	NONE

COUNT/DIVISIONS STRUCTURE

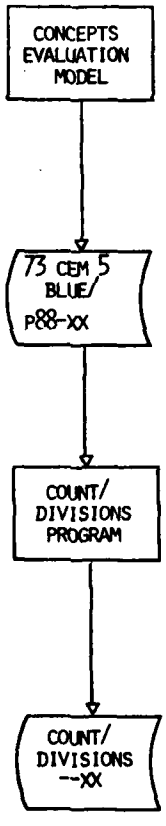


Figure III.17.1

```
UNCLASSIFIED***FILE NAME:COSTART*82XQT  ELEMENT NAME:COUNT/DIVISIONS***UNCLASSIFI

   1:@USE 98.,SECRET*82WARFP88.
   2:@ASG,A 88/     /    .
   3:@ASG,T 8.
   4:@ASG,A 73CEM5.
   5:@ED  73CEM5.BLUE/P88-XX,8.
   6:EXIT
   7:@MSG,N  THE ABOVE PROGRAM FILE "73CEM5" AND ELEMENT "BLUE/P88-XX"
   8:@MSG,N  MAY CHANGE FROM STUDY TO STUDY.  TO INSURE THEY ARE CORRECT
   9:@MSG,N  CHECK WITH THE CEM OPERATOR/ANALYST.
  10:@ASG,T 7.
  11:@ASG,A 82XQT.
  12:@XQT 82XQT.COUNT/DIVISIONS
  13:@ED  7.,98.COUNT/DIVISIONS-XX
  14:LNP!
  15:EXIT
  16:@MSG,N  THE ABOVE ELEMENT FILE "COUNT/DIVISIONS-XX" CONTAINS THE
  17:@MSG,N  OUTPUT OF THIS UTILITY.  THE "XX" SHOULD CORRESPOND TO
  18:@MSG,N  THE CEM INPUT FILE CONTROL NUMBER (IE. 73CEM5.BLUE/P88-XX).
  19:@MSG,N  THIS FILE IS RARELY RUN MORE THAN ONCE DURING A STUDY
  20:@MSG,N  EVEN THOUGH THE CEM WILL BE EXECUTED COUNTLESS TIMES.
  21:@MSG,N  THIS IS DUE TO THE FACT THE FORCE'S STRUCTURE AND ARRIVALS
  22:@MSG,N  STAY RELATIVELY CONSTANT.
  23:@FREE 73CEM5.
  24:@FREE 7.
  25:@FREE 8.
  26:@FREE 88.
```

Figure III.17.2

```
UNCLASSIFIED***EXAMPLE OF THE OUTPUT FROM UTILITY COUNT/DIVISIONS***UNCLASSIFIED

   1: TOTAL NUMBER OF ARRIVING DIVISIONS BY PERIOD.
   2:    8    2    0    0    0    0    0
   3: AVERAGE NUMBER OF ARRIVING DIVISIONS BY PERIOD.
   4:  6.062  1.500  0.000  0.000  0.000  0.000  0.000
   5: NUMBER OF US DIVISIONS IN THEATER ON D-DAY.
   6:  42
   7: THE AVERAGE DIVISIONAL COUNT BY PERIOD.
   8: 48.1 51.5 52.0 52.0 52.0 52.0 52.0
```

Figure III.17.3

Chapter 18
Utility - CONTROL/COMPILER

18.1 DESCRIPTION - The purpose of this utility is to gather and organize data from five input files and produce the CONTROL/XX file. This file will be used in conjunction with the current ITMID/FINAL file, which was produced by the earlier ITMID/REC-A utility, as the two input files to the Equipment Loss Consolidator (ELCON) program which follows.

The five files used as input to the CONTROL/COMPILER utility are:

- o CONTROL/TEMP
- o COUNT/DIVISIONS,
- o SCENARIO/XX,
- o REDARTY/DEGR-XX, and
- o CEM/LOSSES.

18.2 STRUCTURE - Figure III.18.1 displays the overall structure of the utility.

18.3 DATA BASE - The data base which supports this utility is the most complex of the Materiel Postprocessor system. The data base consists of data files; five input and one output files. The files will be discussed in more detail in the following input and output sections.

18.4 RUNSTREAM - The runstream which controls the execution of this utility is pictured in Figure III.18.2. This runstream is cataloged as an element under the program file CSTART*82XQT using the element name CONTROL/COMPILER. As the runstream executes, it accomplishes the following functions:

- o Assigns to the logical unit 88 the current study's program file; in this current case SECRET*82WARFP88. It further requires the user to supply the proper password to obtain access to the file.

- o Assigns the following logical units the designated files for processing:

Logical Unit	File
7	CONTROL/TEMP
8	COUNT/DIVISIONS-XX
9	SCENARIO/XX
10	REDARTY/DEGR-XX
11	CEM/LOSSES-XX
2	OUTPUT

As is the case with other MPP utilities, the XX portions of the file names must be replaced with the CEM control numbers or input data files prior to the execution of the utility. This information can be

obtained from either the CEM Operator/Analyst, in the case of REDARTY/DEGR-XX, or from the previous MPP utilities which produced the COUNT/DIVISIONS-XX, SCENARIO/XX, and CEM/LOSSES-XX files.

- o The utility is executed.

- o The contents of the output file in logical unit 2 are copied to the permanent file CONTROL/XX which is cataloged under the current study's program file, in this case SECRET*82WARFP88. The "XX" portion of the file name must be modified prior to execution of the program to reflect the proper CEM control number. This number can be obtained from the CEM Operator/Analyst.

- o The allocated resources are released.

18.5 INPUT - The source of data for this utility will be provided by a collection of five existing files. Three of the files will have been automatically produced by other MPP utilities, which must have been successfully completed prior to the execution of this utility. These three files are COUNT/DIVISIONS-XX, SCENARIO/XX, and CEM/LOSSES. The remaining two files, CONTROL/TEMP, and REDARTY/DEGR-XX are manually created by the user via the system editor. Source document for the CONTROL/TEMP file will be the previous study's control file; the source document for the REDARTY/DEGR-XX file will be the LOG REPORT produced by the CEM. Each input file will be discussed below.

- o CONTROL/TEMP - As noted above this file is created manually by the user, using the previous study's CONTROL file as its source. This file will provide to the output file both its form and selected elements of information such as:

  - oo Run parameters or control data,

  - oo Number of days in each period,

  - oo For each of the loss rates specified, the first and the last time period considered.

- oo Intertheater transportation loss fraction by air, sea and LOC.

- oo For each of the 4 combat postures, the fractional daily loss for each of the 22 vulnerability categories.

The remaining records inserted into this file will be zeroed out. These records wil be completed by the utility using data extracted from the remaining four input files.

- o COUNT/DIVISIONS - This is the second of the five input files to this utility. It will supply to the utility the number of Blue divisions in theater on a period by period basis.

- o SCENARIO/XX - This is the third file to be used by the utility. This file was produced by the SEARCH/ENGAGEREP utility and denotes for each of the four postures, the daily, fractional loss suffered in each of the 22 vulnerability categories.

- o REDARTY/DEGR-XX - This is the fourth file to be used by this utility. This file was created manually by the via computer terminal edit WARF analyst sponsor using data supplied by the CEM LOG REPORT on RED LOGISTICS EFFECTIVENESS. From this data the utility will record the fraction of full strength Red artilery effectiveness to be applied by time period. The example at Figure 18.6 must be strictly followed.

- o CEM/LOSS - This is the fifth and final file to be used as input by this utility. Using this data the utility will record in the output file, one record for each of the seven time periods in the study detailing within each record percentage losses per 30 days of the 12 types of equipment considered in the theater model.

Using these five input files the utility simply formats and writes the CONTROL/XX file as its output. Examples of these files and their data can be found in Figure III.18.3 through 18.7 which follow this section.

18.6 OUTPUT - There is only one output file produced by this utility. It is called the CONTROL/XX file. The file is cataloged as an element under the current study's program file and will be used as one of the three input to the ELCON utility. The file uses the exact same format as the CONTROL/TEMP file that was used as one of the utility's input files. Further much of the data that was present in that file was simply copied to this output file as was discussed earlier. The remaining information contained in this file was supplied by the other four input files. It should be emphasized that no data in this file is derived; the data is simply read from the input files, organized and written to this output file by the utility.

The output from this utility will consist of eleven record types. The first format of the first record type is presented in Figure 18.8. As can be seen this record will allow the user to control how the ELCON program will execute and how its output will be formatted and stored. The subsequent ten records will provide essential elements of information to the utility. A short description of these records and their contents follows. Figure III.18.8 presents an example of the data found in the file.

FILE: CONTROL/XX
STORAGE: Mass Storage
SOURCE: Utility - CONTROL/COMPILER

RECORD FORMAT

Column	Description	Format
1-5	Number of time period on which data is being input.	I5
6-10	Maximum sequence number of list of materiel items.	I5
11-15	Number of types of items on which combat loss data is derived from theater simulation (currently CEM).	I5
16-20	Number of sets of loss rates to be computed for each item.	I5
21-25	= 0 if historic loss matrix has not been computed for each item and period and stored in a previous run; = 1 if previously computed matrices are read on Logical Unit 2.	I5 I5
26-30	Number of periods for which replacement equipment is prestocked.	I5
31-35	= 0 for short printout; = 1 for long printout. = -1 for no printout (File 7 and File 8 output only).	I5

Number of records	Description	Format
1 or 2 (as needed)	No. of days in each time period	16I5
1 per set of rates	First and last period considered in ith set of rates	2I5
1 or 2 (as needed)	Intertheater loss fraction by time period for air shipment	16F5.4
1 or 2 (as needed)	Intertheater loss fraction by time period for sea shipment	16F5.4

1 or 2 (as needed)	In-theater LOC loss fraction by time period	16F5.4
1 or 2 (as needed)	Average number of Blue divisions in theater by period	16F5.2
1 per period	Fraction of time in attack, defense delay, inactive in period i	4F5.2
8	For each posture (attack, defense, delay, inactive), 2 records with fraction lost per day of each of 22 vulnerability classes	11F6.3
1 or 2 (as needed)	Fraction of full strength Red artillery effectiveness to be applied by time period	16F5.2
1 or 2 (as needed) per period	Losses from theater model in period i for each type of equipment considered in theater model (expressed as percent lost per 30 days)	16F5.2

18.7 PERFORMANCE - This utility will require the following resources to execute properly:

CORE:	10K OR LESS
CPU TIME:	5 MIN OR LESS
CLOCK TIME:	15 MIN OR LESS
DISK UNITS:	1 - 2
COMMENTS:	NONE

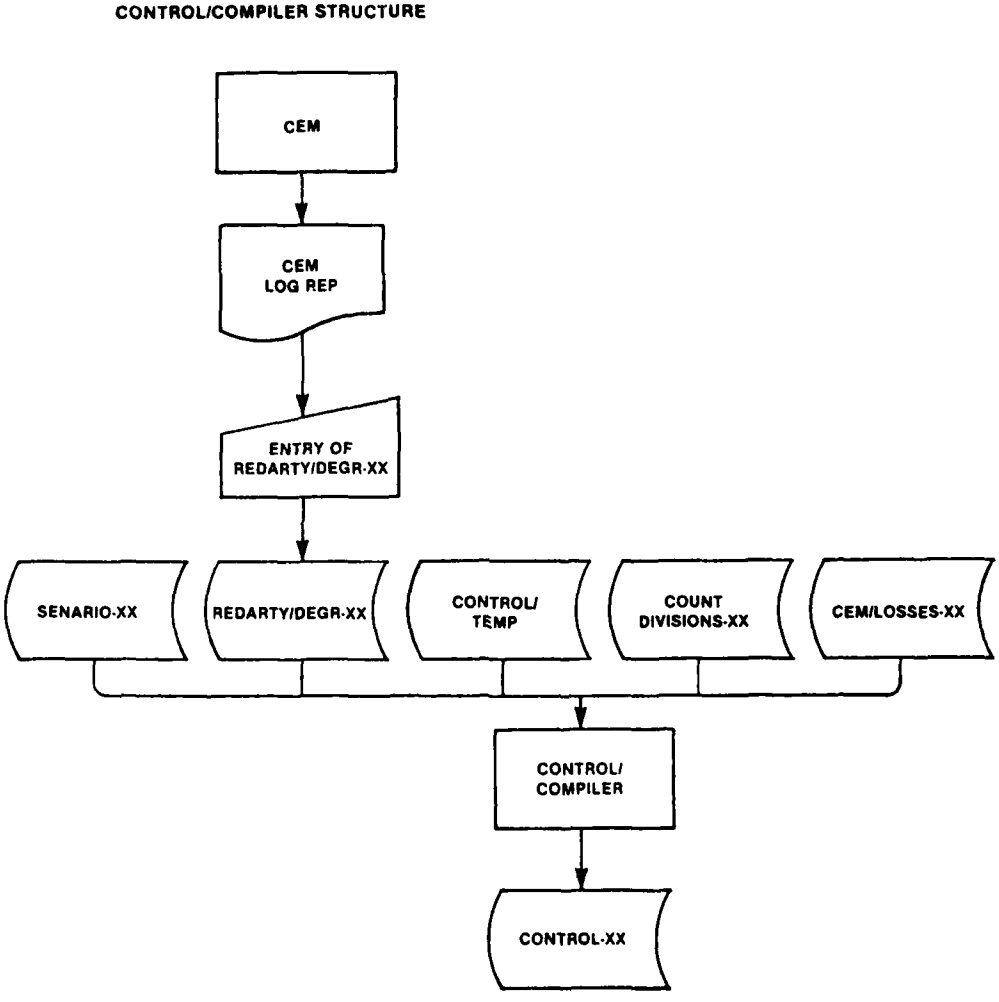


Figure III.18.1

```
UNCLASSIFIED***FILE NAME:CSTART*82XQT  ELEMENT NAME:CONTROL/COMPILER***UNCLASSIF

   1:@USE 88.,SECRET*82WARFP88.
   2:@ASG,A 88/     /    .
   3:@ASG,T 7.
   4:@ED  88.CONTROL/TEMP,7.
   5:EXIT
   6:@MSG,N  THE ABOVE ELEMENT FILE "CONTROL/TEMP" CONTAINS DATA
   7:@MSG,N  ON TWO SECTIONS OF THE CONTROL FILE THAT MUST BE MANUALLY
   8:@MSG,N  EDITTED.  THIS UTILITY USES THIS DATA IN CREATING THE
   9:@MSG,N  COMPLETED CONTROL FILE.
  10:@ASG,T 8.
  11:@ED  88.COUNT/DIVISIONS-XX,8.
  12:EXIT
  13:@MSG,N  THE ABOVE ELEMENT FILE "COUNT/DIVISIONS-XX" CONTAINS
  14:@MSG,N  THE OUTPUT DATA OF UTILTITY "82XQT.COUNT/DIVISIONS".  THE
  15:@MSG,N  "XX" IN THE ELEMENT NAME SHOULD MATCH THE APPROPRIATE CEM
  16:@MSG,N  BLUE FORCE INPUT DATA FILE.
  17:@ASG,T 9.
  18:@ED  88.SCENARIO/XX,9.
  19:EXIT
  20:@MSG,N  THE ABOVE ELEMENT FILE "SCENARIO/XX" CONTAINS THE OUTPUT
  21:@MSG,N  DATA FROM UTILITY "82XQT.SEARCH/ENGAGEREP" ON THE PERCENT
  22:@MSG,N  OF TIME US FORCES SPENT IN THE FOUR COMBAT POSTURES
  23:@MSG,N  FOR EACH TIME PERIOD. THE "XX" IN THE ELEMENT NAME MUST
  24:@MSG,N  MATCH THE APPROPRIATE CEM RUN CONTROL NUMBER.
  25:@ASG,T 10.
  26:@ED  88.REDARTY/DEGR-XX,10.
  27:EXIT
  28:@MSG,N  THE ABOVE ELEMENT FILE "REDARTY/DEGR-XX" CONTAINS
  29:@MSG,N  DATA ON RED ARTILLERY CAPABILITY FOR EACH TIME PERIOD (EX-
  30:@MSG,N  PRESSED IN ROWS EXPENDED).  THIS DATA WAS MANUALLY EDITTED
  31:@MSG,N  FROM THE CEM LOG REPORT (73LOGREP).  THE "XX" IN THE
  32:@MSG,N  ELEMENT NAME MUST MATCH THE APPROPRIATE CEM RUN
  33:@MSG,N  CONTROL NUMBER.
  34:@ASG,T 11.
  35:@ED  88.CEM/LOSSES-XX,11.
  36:EXIT
  37:@MSG,N  THE ABOVE ELEMENT FILE "CEM/LOSSES-XX" CONTAINS OUTPUT
  38:@MSG,N  DATA FROM THE UTILITY "82XQT.CEM/LOSSES" ON THE LOSS RATES
  39:@MSG,N  FOR WARF MIF PLAYED IN CEM.  THE "XX"IN THE ELEMENT NAME
  40:@MSG,N  MUST CORRESPOND TO THE APPROPPRIATE CEM PUN CONTROL NUMBER.
  41:@ASG,T 2.
  42:@ASG,A 82XQT.
  43:@XQT 82XQT.CONTROL/COMPILER
  44:@ED  2.,88.CONTROL/XX
  45:LNP!
  46:EXIT
  47:@MSG,N  THE ABOVE ELEMENT FILE "CONTROL/XX" CONTAINS THE OUTPUT
  48:@MSG,N  OF THIS UTILITY WHICH WILL SERVE AS INPUT TO THE ELCON.
  49:@MSG,N  THE "X" IN THE ELEMENT NAME MUST MATCH THE APPROPRIATE CEM
  50:@MSG,N  RUN CONTROL NUMBER.
  51:@FREE 7.
  52:@FREE 8.
  53:@FREE 9.
  54:@FREE 10.
  55:@FREE 11.
  56:@FREE 2.
  57:@FREE 88.
```

Figure III.18.2

```
UNCLASSIFIED***EXAMPLE OF A CONTROL/TEMP DATA FILE***UNCLASSIFIED

   1:ADD 88.CONTROL/TEMP
   2:TEMPORARY CONTROL DATA FILE WARF P88(12DEC80)
   3:     7 1200   13   10    0    2   -1
   4:    15   15   30   30   30   30   30
   5:     1    1
   6:     2    2
   7:     1    2
   8:     3    3
   9:     4    4
  10:     5    5
  11:     6    6
  12:     7    7
  13:     1    4
  14:     5    7
  15:  .05  .05  .05  .01  .01  .00  .00
  16:  .15  .15  .23  .10  .05  .02  .00
  17:  .15  .15  .10  .10  .05  .05  .05
  18:  0.0  0.0  0.0  0.0  0.0  0.0  0.0
  19: .000 .000 .000 .000
  20: .000 .000 .000 .000
  21: .000 .000 .000 .000
  22: .000 .000 .000 .000
  23: .000 .000 .000 .000
  24: .000 .000 .000 .000
  25: .000 .000 .000 .000
  26:  .000  .994  .211 1.666  .222  .111  .666  .090  .138  .893  .574
  27:  .224  .691  .264  .714  .999  .744  .359  .807  .644  .921  .100
  28:  .100  .992  .600 2.744  .578  .000  .299  .000  .704  .000 2.192
  29: 7.682 3.339  .668 1.750 1.199  .502  .078  .515  .597  .000  .080
  30:  .200 2.507 1.254  .927  .494  .000  .633  .000  .283  .284 1.609
  31: 6.753 3.355  .895 3.001 1.678 1.789  .465  .898  .566  .000  .090
  32:  .050  .255  .064  .555  .888  .010  .088  .550  .823  .760  .064
  33: 3.142 7.460  .533  .850  .973  .349  .077  .050  .778  .000  .080
  34:  .000 .000 .000 .000 .000 .000 .000
  35:    .00   .00   .00   .00   .00   .00   .00   .00   .00   .00   .00   .00
  36:    .00   .00   .00   .00   .00   .00   .00   .00   .00   .00   .00   .00
  37:    .00   .00   .00   .00   .00   .00   .00   .00   .00   .00   .00   .00
  38:    .00   .00   .00   .00   .00   .00   .00   .00   .00   .00   .00   .00
  39:    .00   .00   .00   .00   .00   .00   .00   .00   .00   .00   .00   .00
  40:    .00   .00   .00   .00   .00   .00   .00   .00   .00   .00   .00   .00
  41:    .00   .00   .00   .00   .00   .00   .00   .00   .00   .00   .00   .00
  42:**********************************************************************
  43:COMMENTS:
  44:         THE ABOVE ELEMENT FILE "CONTROL/TEMP" IS CREATED BY MANUALLY
  45:         EDITTING A PREVIOUS STUDIES CONTROL FILE INTO THE CURRENT
  46:         WARF STUDY'S PROGRAM FILE (IN THIS EXAMPLE "SECRET*82WARFP88").
  47:         LINES 1-16 MUST BE EDITTED WITH THE CURRENT STUDY DATA ON
  48:         REPORTING AS DIRECTED BY THE STUDY DIRECTOR AND IAW TABLES
  49:         4-4 AND 4-5 OF THE ELCON MANUAL CAA-D-79-3, DATED AUGUST 1979.
  50:         THESE LINES CONTAIN DATA ON THE #TIME PERIODS, #LIN CODES,
  51:         #CEM ITEMS, #RATES TO BE COMPUTED, #DAYS OF PREPOSITIONED
  52:         STOCK, TYPE OF REPORT, LENGTH OF TIME PERIODS, INTERTHEATER
  53:         LOGISTIC (SEA AND AIR) LOSSES, AND INTRATHEATER LOGISTIC
  54:         LOSSES.  FOLLOWING THE COMPLETION OF WARFRAM AND THE CALCUL-
  55:         ATION OF LOSS RATES FOR THE 22 ARTILLERY VULNERABILITY
  56:         CATEGORIES FOR EACH COMBAT POSTURE LINES 25-32 MUST BE FILLED
  57:         IN WITH THIS DATA IAW TABLE 4-5 OF THE ELCON MANUAL MENTIONED
  58:         ABOVE.  THESE LINE NUMBERS MAY CHANGE DUE TO THE ADDITION OR
  59:         DELETION OF DATA.  THE REMAINDER OF THE FILE CURRENTLY SHOWN
  60:         WITH ZEROS WILL BE FILLED OUT BY THE EXECUTION OF UTILITY
  61:         "82XQT,CONTROL/COMPILER".  THIS UTILITY WILL CREAT A NEW
  62:         CONTROL FILE ELEMENT, WHICH WILL BE USED IN THE EXECUTION
  63:         OF ELCON.
```

Figure III.18.3

```
UNCLASSIFIED***EXAMPLE OF THE OUTPUT FROM UTILITY COUNT/DIVISIONS***UNCLASSIFIED

   1: TOTAL NUMBER OF ARRIVING DIVISIONS BY PERIOD.
   2:    8    2    0    0    0    0    0
   3: AVERAGE NUMBER OF ARRIVING DIVISIONS BY PERIOD.
   4:  6.062  1.500  0.000  0.000  0.000  0.000  0.000
   5: NUMBER OF US DIVISIONS IN THEATER ON D-DAY.
   6:  42
   7: THE AVERAGE DIVISIONAL COUNT BY PERIOD.
   8: 48.1 51.5 52.0 52.0 52.0 52.0 52.0
```

Figure III.18.4

```
UNCLASSIFIED***EXAMPLE OF THE OUTPUT FROM UTILITY SEARCH/ENGAGEREP***UNCLASSIFIE

  1: ICYCLE=   1            BLUE PARTITION 1
  2: ICYCLE=   2            BLUE PARTITION 1
  3: ICYCLE=   3            BLUE PARTITION 1
  4: ICYCLE=   4            BLUE PARTITION 1
  5: ICYCLE=   5            BLUE PARTITION 1
  6: ICYCLE=   6            BLUE PARTITION 1
  7: ICYCLE=   7            BLUE PARTITION 1
  8: ICYCLE=   8            BLUE PARTITION 1
  9: ICYCLE=   9            BLUE PARTITION 1
 10: ICYCLE=  10            BLUE PARTITION 1
 11: ICYCLE=  11            BLUE PARTITION 1
 12: ICYCLE=  12            BLUE PARTITION 1
 13: ICYCLE=  13            BLUE PARTITION 1
 14: ICYCLE=  14            BLUE PARTITION 1
 15: ICYCLE=  15            BLUE PARTITION 1
 16:                              .0
 17:                              .0
 18:                              .0
 19:                              .0
 20:                           243.7
 21:                           338.2
 22:                            39.6
 23:                          2570.6
 24:                           202.0
 25:                                                  .000
 26:                                                  .171
 27:                                                  .012
 28:                                                  .817
 29: ICYCLE=  16            BLUE PARTITION 1
 30: ICYCLE=  17            BLUE PARTITION 1
 31: ICYCLE=  18            BLUE PARTITION 1
 32: ICYCLE=  19            BLUE PARTITION 1
 33: ICYCLE=  20            BLUE PARTITION 1
 34: ICYCLE=  21            BLUE PARTITION 1
 35: ICYCLE=  22            BLUE PARTITION 1
 36: ICYCLE=  23            BLUE PARTITION 1
 37: ICYCLE=  24            BLUE PARTITION 1
 38: ICYCLE=  25            BLUE PARTITION 1
 39: ICYCLE=  26            BLUE PARTITION 1
 40: ICYCLE=  27            BLUE PARTITION 1
 41: ICYCLE=  28            BLUE PARTITION 1
 42: ICYCLE=  29            BLUE PARTITION 1
 43: ICYCLE=  30            BLUE PARTITION 1
 44:                           213.9
 45:                           339.5
 46:                           286.3
 47:                            30.3
 48:                           475.9
 49:                           644.0
 50:                            70.7
 51:                          5314.4
 52:                           457.0
 53:                                                  .109
 54:                                                  .145
 55:                                                  .009
 56:                                                  .737
 57: ICYCLE=  31            BLUE PARTITION 1
```

Figure III.18.5

UNCLASSIFIED***EXAMPLE OF INPUT DATA REQARTY/DECR TO UTILITY CONTROL/COMPILER

CEM REPORT GENERATOR
73CEM5-RUNSEC/PBF-015 4*C DTOCTBO *UNCLASSIFIED*
REQ LOGISTIC EXPERIENCE BY MAJOR ITEM TYPE

QUANTITIES SHOWN FOR END OF THEATER CYCLE UNLESS OTHERWISE LABELED.

CATEGORY ARTAMM — TYPE WITHIN CATEGORY — TOTAL — DISPLAY UNITS TONS

THIR CYCLE	COMBAT UNIT STATUS AUTHORIZED	ON HAND	PER-CENT	GAINS TO THEATER STOCKS RE-SUPPLY	RE-PAIR	TOTAL GAINS	THEATER STOCKS AT END-CYCLE	IN RE PAIR AT END	COMBAT LOSS EXPERIENCE TEMP.	PERM.	TOTAL COMBAT	NON-COMBAT LOSSES TEMP.	PERM.	TOTAL LOSSES DURING TH. CYC.	T T L EM
				N/A	N/A	N/A	0.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
0	105775.	105775.	100.0	N/A	N/A	N/A	0.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
1	117625.	117259.	99.7	93039.	0.	93039.	69718.	0.	0.	49687.	49687.	0.	0.	49687.	
2	131425.	131013.	99.7	93039.	0.	93039.	75956.	0.	0.	60946.	60946.	0.	0.	60946.	
3	138715.	138296.	99.7	93039.	0.	93039.	105106.	0.	0.	63099.	63099.	0.	0.	63099.	
4	151915.	151466.	99.7	93039.	0.	93039.	131824.	0.	0.	66352.	66352.	0.	0.	66352.	
5	171640.	171147.	99.7	93039.	0.	93039.	151885.	0.	0.	71021.	71021.	0.	0.	71021.	
6	187440.	186976.	99.7	93039.	0.	93039.	176242.	0.	0.	70654.	70654.	0.	0.	70654.	
7	193740.	193069.	99.8	93033.	0.	93039.	200422.	0.	0.	68866.	68866.	0.	0.	68866.	
8	193740.	193251.	99.8	110699.	0.	110699.	217419.	0.	0.	73721.	73721.	0.	0.	73721.	
9	193740.	193186.	99.7	110699.	0.	110699.	265574.	0.	0.	82057.	82057.	0.	0.	82057.	
10	193740.	193150.	99.7	110699.	0.	110699.	297652.	0.	0.	88622.	88622.	0.	0.	88622.	
11	193740.	192537.	97.4	110699.	0.	110699.	309314.	0.	0.	91613.	91613.	0.	0.	91613.	
12	193740.	192537.	97.4	110699.	0.	110699.	326602.	0.	0.	95412.	95412.	0.	0.	95412.	
13	193740.	192541.	97.4	110699.	0.	110699.	340471.	0.	0.	94832.	94832.	0.	0.	94832.	
14	193740.	192542.	97.4	110699.	0.	110699.	356974.	0.	0.	94198.	94198.	0.	0.	94198.	
15	193740.	192564.	97.4	110699.	0.	110699.	376339.	0.	0.	91336.	91336.	0.	0.	91336.	
16	193740.	192558.	97.4	110699.	0.	110699.	391979.	0.	0.	93061.	93061.	0.	0.	93061.	
17	193740.	192527.	97.4	110699.	0.	110699.	410193.	0.	0.	94487.	94487.	0.	0.	94487.	
18	193740.	192560.	97.4	110699.	0.	110699.	429357.	0.	0.	92537.	92537.	0.	0.	92537.	
19	193740.	192556.	97.4	110699.	0.	110699.	446389.	0.	0.	92665.	92665.	0.	0.	92665.	
20	193740.	192565.	97.4	110699.	0.	110699.	465260.	0.	0.	91830.	91830.	0.	0.	91830.	
21	193740.	192566.	97.4	110699.	0.	110699.	485738.	0.	0.	90223.	90223.	0.	0.	90223.	
22	193740.	192568.	97.4	110699.	0.	110699.	505911.	0.	0.	90528.	90528.	0.	0.	90528.	
23	193740.	192578.	97.4	110699.	0.	110699.	525685.	0.	0.	90927.	90927.	0.	0.	90927.	
24	193740.	192569.	97.4	17630.	0.	17630.	453837.	0.	0.	89481.	89481.	0.	0.	89481.	
25	193740.	192586.	97.4	17630.	0.	17630.	387437.	0.	0.	88032.	88032.	0.	0.	88032.	
26	193740.	192589.	97.4	17630.	0.	17630.	314246.	0.	0.	86822.	86822.	0.	0.	86822.	
27	193740.	192587.	97.4	17630.	0.	17630.	244830.	0.	0.	87047.	87047.	0.	0.	87047.	
28	193740.	192592.	97.4	17630.	0.	17630.	176240.	0.	0.	86221.	86221.	0.	0.	86221.	
29	193740.	192602.	97.4	17630.	0.	17630.	107370.	0.	0.	86500.	86500.	0.	0.	86500.	
30	193740.	192586.	97.4	17630.	0.	17630.	38165.	0.	0.	86936.	86836.	0.	0.	86936.	
31	193740.	153395.	80.6	17630.	0.	17630.	0.	0.	0.	89565.	89565.	0.	0.	89565.	
32	193740.	94781.	47.9	17630.	0.	17630.	0.	0.	0.	82744.	82744.	0.	0.	82744.	
33	193740.	57253.	29.0	17630.	0.	17630.	0.	0.	0.	55059.	55059.	0.	0.	55059.	
34	193740.	42436.	21.5	17630.	0.	17630.	0.	0.	0.	32587.	32587.	0.	0.	32587.	
35	193740.	35542.	18.0	17630.	0.	17630.	0.	0.	0.	24524.	24524.	0.	0.	24524.	
36	193740.	31788.	16.1	17630.	0.	17630.	0.	0.	0.	21384.	21384.	0.	0.	21384.	
37	193740.	29449.	14.9	17630.	0.	17630.	0.	0.	0.	19969.	19969.	0.	0.	19969.	
38	193740.	29072.	14.2	17630.	0.	17630.	0.	0.	0.	19007.	19007.	0.	0.	19007.	
39	193740.	27322.	13.8	17630.	0.	17630.	0.	0.	0.	18379.	18379.	0.	0.	18379.	
40	193740.	26829.	13.6	17630.	0.	17630.	0.	0.	0.	18128.	18128.	0.	0.	18128.	
41	193740.	26538.	13.4	17630.	0.	17630.	0.	0.	0.	17920.	17920.	0.	0.	17920.	
42	193740.	26215.	13.3	17630.	0.	17630.	0.	0.	0.	17948.	17948.	0.	0.	17948.	
43	193740.	25934.	13.1	17630.	0.	17630.	0.	0.	0.	17912.	17912.	0.	0.	17912.	
44	193740.	25758.	13.0	17630.	0.	17630.	0.	0.	0.	17806.	17806.	0.	0.	17806.	
45	193740.	25622.	13.0	17630.	0.	17630.	0.	0.	0.	17766.	17766.	0.	0.	17766.	
*** MEANS OF VALUES IN ABOVE TABLE ***															
	191343.	137560.	72.9	62451.	0.	62451.	196780.	0.	0.	66277.	66277.	0.	0.	66277.	

*** WAR TOTALS FOR RESUPPLY, REPAIRS, AND LOSSES ***

GAIN FROM RESUPPLY	GAIN FROM REPAIR	PERM. COMBAT LOSSES	PERM. NON-COMBAT LOSSES	TOTAL PERMANENT LOSSES	TOTAL TEMP LOSSES (MAINT OC)
2910317.	0.	2982474.	0.	2982474.	0.

Figure III.18.6

```
UNCLASSIFIED***EXAMPLE OF THE OUTPUT FROM UTILITY CEM/LOSSES***UNCLASSIFIED                    DATE 021081

  1:  15   1  15
  2:                              AVERAGE 15-DAY LOSS RATES **D-1 TO D-15**
  3:                .32     .07     .00     .05   12.39   58.56    4.65  348.47  135.66   58.95    7.15   27.08
  4:                .12     .11     .18   13.17    1.35    7.97   13.10  126.64   36.76  225.05  217.27    9.53
  5:                .36    3.32   55.97     .75     .39
  6:                .00     .00     .09     .00   92.62  147.30  326.03   25.58     .00     .00     .00     .00
  7:RD9CEM     01- 9   64.0   14.0      .0   10.0   24.0   36.0   72.0   78.0   18.0
  8:
  9:
 10:
 11:
 12:
 13:
 14:  15  16  30
 15:                              AVERAGE 15-DAY LOSS RATES **D-16 TO D-30**
 16:                .28     .07     .61     .10    5.42    9.98   34.50  102.00   70.93   26.13   47.82   13.72
 17:                .17     .12     .26    7.53    2.06    8.29   89.24   58.41   14.75  149.91  110.82   77.73
 18:                .30   12.65    8.70     .42     .21
 19:                .00     .00     .09     .06   38.72   54.12  105.59   11.38     .00     .00     .00     .00
 20:RD9CEM     01- 9   56.0   14.0  122.0   20.0   34.0   52.0   60.0   42.0   18.0
 21:
 22:
 23:
 24:
 25:
 26:
 27:  30   1  30
 28:  30   1  60
 29:  30   1  90
 30:                              AVERAGE 30-DAY LOSS RATES **D-1 TO D-90**
 31:                .40     .09     .50     .12     .00     .00     .00     .00     .00     .00     .00     .00
 32:                .23     .15     .33     .00     .00     .00     .00     .00     .00     .00     .00     .00
 33:                .27     .00     .00     .55     .27
 34:                .00     .00     .14     .07     .00     .00     .00     .00     .00     .00     .00     .00
 35:RD9CEM     01- 9   40.0    9.0   50.0   12.0   23.0   33.0   27.0   27.0   14.0
 36:
 37:
 38:
 39:
 40:
 41:
 42:  30  91  12
 43:  30  91  15
 44:  30  91  18
 45:                              AVG 30-DAY LOSS RATES **D-91 TO D-180**
 46:                .22     .03     .82     .04     .00     .00     .00     .00     .00     .00     .00     .00
 47:                .11     .08     .21     .00     .00     .00     .00     .00     .00     .00     .00     .00
 48:                .03     .00     .00     .11     .03
 49:                .00     .00     .04     .00     .00     .00     .00     .00     .00     .00     .00     .00
 50:RD9CEM     01- 9   22.0    3.0   82.0    4.0   11.0   21.0    3.0    3.0    4.0
 51:
 52:
 53:
 54:
 55:
 56:
 57:                              30-DAY LOSS RATE ** D-1 TO D-30**
```

Figure III.18.7

```
UNCLASSIFIED***EXAMPLE OF THE OUTPUT DATA FROM UTILITY CONTROL/COMPILER***UNCLAS

   1:TEMPORARY CONTROL DATA FILE WARF P88(12DEC
   2:     7     6     9    10     0     2    -1
   3:    15    15    30    30    30    30    30
   4:     1     1
   5:     2     2
   6:     1     2
   7:     3     3
   8:     4     4
   9:     5     5
  10:     6     6
  11:     7     7
  12:     1     4
  13:     5     7
  14:  .05   .05   .05   .01   .01   .00   .00
  15:  .15   .15   .23   .10   .05   .02   .00
  16:  .15   .15   .10   .10   .05   .05   .05
  17: 48.1 51.5 52.0 52.0 52.0 52.0 52.0
  18: .000 .141 .059 .800
  19: .255 .145 .050 .600
  20: .200 .155 .005 .640
  21: .100 .055 .105 .840
  22: .005 .055 .140 .800
  23: .305 .005 .000 .690
  24: .555 .000 .000 .445
  25:  .000  .994  .711 1.666  .222  .111  .666  .090  .138  .899  .574
  26:  .224  .691  .264  .714  .999  .744  .359  .807  .644  .921  .100
  27:  .100  .992  .600 2.744  .578  .000  .299  .000  .704  .000 2.192
  28: 7.682 3.333  .668 1.750 1.199  .502  .078  .515  .597  .000  .080
  29:  .200 2.507 1.254  .927  .494  .000  .633  .000  .283  .284 1.609
  30: 6.753 3.355  .895 3.001 1.679 1.799  .465  .898  .566  .000  .090
  31:  .050  .255  .064  .555  .888  .010  .088  .550  .923  .760  .064
  32: 3.142 7.460  .533  .850  .973  .349  .077  .050  .778  .000  .080
  33:  .649 .764 .9801.000 .950 .485 .196
  34:  64.00  1.40   .00   .00 10.00 24.00 36.00 72.00  7.80   .00  8.00   .00   .00
  35:  56.00  1.40   .00  2.00 20.00 34.00 52.00 60.00  4.20   .00  8.00   .00   .00
  36:  50.00   .90   .00  2.00 15.00 24.00 37.00 28.00  2.30   .00  7.00   .00   .00
  37:  27.00   .50   .00   .00  6.00 18.00 25.00 10.00   .60   .00   .00   .00   .00
  38:  19.00   .40   .00   .00  5.00 13.00 16.00  4.00   .50   .00  6.00   .00   .00
  39:  30.00   .30   .00  4.00  4.00 14.00 33.00  3.00   .10   .00  4.00   .00   .00
  40:  17.00   .10   .00  2.00  3.00  7.00 15.00  1.00   .10   .00  1.00   .00   .00
```

Figure III.18.8

CHAPTER 19

UTILITY - FINAL/REPORT

19.1 DESCRIPTION - The purpose of this utility is to combine the three output files from the ELCON program and the ITMID/FINAL file to produce a report on WARF daily attrition rates. Since the output from ELCON expresses loss rates in monthly terms, this utility will divide the ELCON loss rates by 30 to determine the daily rates. The only output from this utility is the printed report. The report is not used as input to any following automated program, but may be used in the final printed study report.

19.2 STRUCTURE - Figure III.19.1 displays the overall structure of this utility.

19.3 DATA BASE - The data base which is used to support this utility consists of four files. One file, the ITMID/FINAL, is produced by the ITMID/REC-A utility. The remaining 3 files, RATES-XX/SEC-1, RATES-XX/MONTHLY-WOL, and RATES-XX/MONTHLY-WL are produced by ELCON. All files are stored on mass storage devices under the program file of the current study, in this case SECRET*82WARFP88.

19.4 RUNSTREAM - The runstream used to control the execution of this utility is pictured in Figure III.19.2. The runstream is cataloged as an element under the program file CSTART*82XQT. As the runstream executes, it accomplishes the following functions:

- o Assigns to the logical unit 88 the current study's program file, in this case SECRET*82WARFP88, and requires the user to supply the appropriate password.
- o Assigns to the logical unit 8, file RATES-XX/SEC-1; unit 9, RATES-XX/MONTHLY-WL; unit 10, ITMID/FINAL; and unit 11, RATES-XX/MONTHLY-WOL.
- o Executes the utility.
- o The results of the utility are collected on unit 7 and copied into the permanent file FINAL/REPORT-XX. The XX portion of the file name must be changed to reflect the current CEM Run Control Number which can be obtained from the CEM Operator/Analyst.
- o The existing 82PRT file is deleted.
- o The 82PRT file is created again and unconditionally cataloged as a public file with no read/write key.
- o Using the Breakpoint facility of the UNIVAC 1100, prepare the FINAL/REPORT file for printing and assign it a header "record."

- o Schedule the report for printing on unlined paper.
- o Deletes the print file 82 PRT after printing.
- o Releases the resources allocated to the utility.

19.5 INPUT - The utility uses four input files, all cataloged under the current study's program file, in this instance, SECRET*82WARFP88. These files are the ITMID/FINAL, RATES-XX/SEC-1, RATES-XX/MONTHLY-WOL and RATES-XX/MONTHLY-WL. Each file is discussed below.

- o ITMID/FINAL - This file is produced by the ITMID-REC-A utility. It details each major item of equipment being analyzed in the study. For each item it provides the item's code identifier, nomenclature or description, its CEM type artillery vulnerability/historical class (where applicable) as well as a period by period summary of the authorized quantities of this item plus a combat zone by combat zone summary of the distribution or density of the item throughout the battle area. Figure III.19.3 presents the example of the data for this file.

FILE: ITMID/FINAL
STORAGE MEDIUM: Mass Storage
SOURCE: UTILITY - ITMID/RECA

RECORD FORMAT:

Position	Description	Format
Record 1:		
1	Blank	1X
2 - 7	Line item number (LIN)	A6
8	Blank	1X
9 - 38	Alphanumeric nomenclature	5(A6)
39	Blank	1X
40 - 41	Type equipment code for losses from theater model	I2
42 - 43	Vulnerability class for losses from artillery model	I2
44 - 45	Classification for historical data	I2
46 - 48	In-theater depot stockage (number of days supply)	I3
49 - 50	Fraction of intertheater shipment which is by air	F2.2
51 - 52	= 1 if actual equipment density is to be read and used	I2

	= 0 if density is to be estimated from the number of divisions in theater	
53 - 54	= 1 if combat losses are from the theater simulation = 2 if combat losses are from artillery models = 3 if all loss are from history	I2
55 - 58	Sequence number	I4

Position	Description	Format
Record 2:		
1 - 49	Quantities of this line item for the seven time periods of the exercise, obtained from the new ITMID/TEMP file.	7(I7)
Record 3-9:		
1 - 35	Density Profiles for Time Period N for this line item in each of the five zones or areas being played in this exercise. These density profiles are obtained from the new ITMID/TEMP file. There must be seven occurrences of this record; one for each time period being played.	5(F5.2)

- RATES-XX/SEC-1 - This file is produced by the ELCON program. It summarizes for the utility the control information under which the ELCON program was executed. In addition to a summary for each major piece of equipment a summary of its loss rates in different periods from a variety of causes. The USACAA document CAA-D-79-3 in Appendix B presents a complete example of a typical file on pages D1 - D2. The FINAL/REPORT program will simply read this file and write the contents out.

  It should be noted that the ELCON program discussed in Chapter 2 has the option of executing without producing this file. If this is the case, the FINAL/REPORT program will not execute because it expects the file to exist.

- RATES-XX/MONTHLY-WOL - This file details for each major item of equipment in the study in-theater monthly losses per WARF set excluding LOC and Depot losses. Figure III.19.4 presents the sample data for this file.

FILE: RATES-XX/MONTHLY-WOL
STORAGE: Mass Storage
SOURCE: ELCON

RECORD FORMAT:

Column	Description	Format
1	BLANK	1X
2 - 7	LINCODE	A6
8	BLANK	1X
9 - 38	Nomenclature	5(A6)
39 - 86	Monthly loss rates of this item for each time period in the study. These rates are calculated excluding LOC and Depot losses.	8(F6.2)

- RATES-XX/MONTHLY-WL - This file details for each major item in the study total monthly loss rates per WARF set including LOC, depot and inter-theater shipping losses. Figure III.19.5 presents the sample data for this file.

FILE: RATES-XX/MONTHLY-WL
STORAGE: Mass Storage
SOURCE: ELCON

RECORD FORMAT:

Column	Description	Format
1	BLANK	1X
2 - 7	LINCODE	A6
8	BLANK	X
9 - 38	Nomenclature	5(A6)
39 - 86	Monthly loss rates of this item for each time period in the study. These loss rates are calculated using LOC, Depot and inter-theater shipping losses.	8(F6.2)

19.6 OUTPUT - The only output from this utility is the FINAL/REPORT. This report is a formatted, printed summary of daily loss rates of the Materiel Postprocessor (MPP) and the ELCON.

It should be emphasized that loss rates expressed in this report are daily loss rates rather than monthly loss calculated in the ELCON. To get these daily loss rates the monthly loss rates are simply divided by 30.

Figure III.19.6 presents an example of the FINAL/REPORT output.

19.7 PERFORMANCE - This utility will require the following resources in order to execute properly:

CORE:	Less than 30K
CPU TIME:	Less than 3 minutes
CLOCK TIME:	Less than 10 minutes
DISK UNITS:	Four (file) units, default (128 tracks) storage
COMMENTS:	None

FINAL/REPORT STRUCTURE

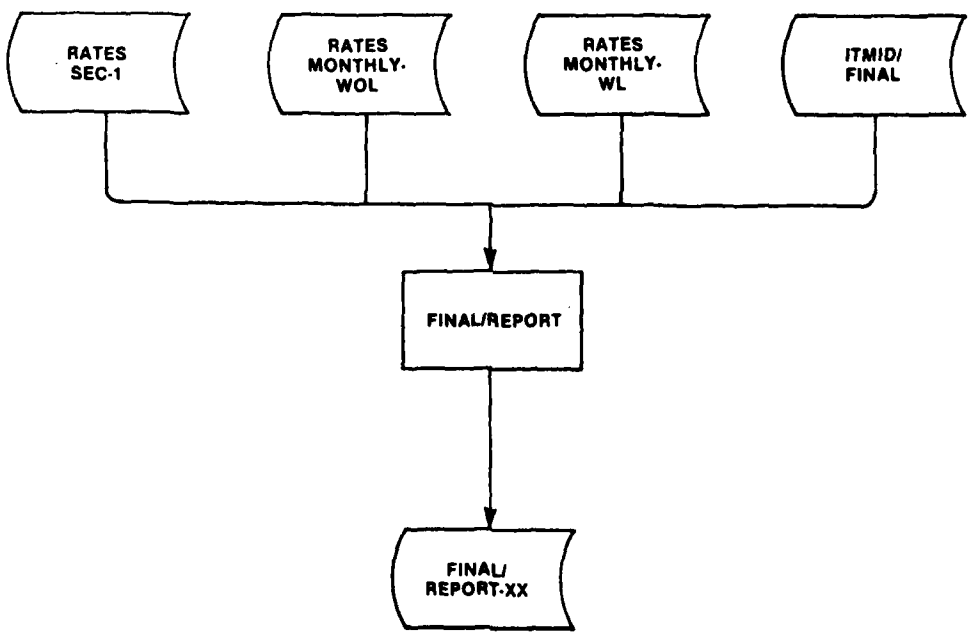


Figure III.19.1

```
UNCLASSIFIED***FILE NAME:CSTART*82XQT  ELEMENT NAME:FINAL/REPORT***UNCLASSIFIED

  1:@USE 88.,SECRET*82ROK87.
  2:@ASG,A 88/    /   .
  3:@ASG,T 7.,///500
  4:@ASG,T 8.,///200
  5:@ASG,T 9.,///200
  6:@ASG,T 10.,///500
  7:@ASG,T 11.,///200
  8:@ASG,A 82XQT.
  9:@ED   88.RATES-40/SEC-1,8.
 10:EXIT
 11:@ED   88.RATES-40/MONTHLY-WCL,11.
 12:EXIT
 13:@ED   88.RATES-40/MONTHLY-WL,9.
 14:EXIT
 15:@ED   88.ITMID/FINAL,10.
 16:EXIT
 17:@MSG,N  THE FOUR ELEMENT FILES ABOVE CONTAIN THE INPUT DATA
 18:@MSG,N  FOR THIS UTILITY.  THE FIRST THREE CONTAIN THE OUTPUT
 19:@MSG,N  OF THE ELCON AND THE FOURTH THE FINAL ITMID FILE.
 20:@MSG,N  THE ITMID FILE IS USED HERE THE RETRIEVE THE AUTHERIZED
 21:@MSG,N  QUANTITIES OF EACH LIN CODE (MIE).
 22:@XQT 82XQT.FINAL/REPORT
 23:@ED   7.,88.FINAL/REPORT-40
 24:115
 25:P 20
 26:LAST
 27:EXIT
 28:@MSG,N  THE ABOVE ELEMENT FILE "FINAL/REPORT-40" WILL CONTAIN
 29:@MSG,N  THE OUTPUT OF THIS UTILITY. THE FINAL WARF ATTRITION
 30:@MSG,N  RATES REPORT FOR A SPECIFIC CEM RUN.  THE "XX" IN THE
 31:@MSG,N  ELEMENT NAME MUST CORRESPOND THE CEM RUN CONTROL NUMBER.
 32:@DELETE,C 82PRT.
 33:@ASG,UP 82PRT.,///500
 34:@BRKPT PRINT$/82PRT
 35:@HOG                  (S) ATTRITION RATES WITH & WITHOUT LOG LOSSES WARF 87
 36:@PRT,S 88.FINAL/REPORT-40
 37:@BRKPT PRINT$
 38:@FREE 82PRT.
 39:@SYM 82PRT.,,PR2
 40:@MSG,N  THE ABOVE BRKPT WILL PROVIDE A PRINTED COPY OF THE REPORT
 41:@MSG,N  ON UNLINED PAPER.
 42:@DELETE,C 82PRT.
 43:@FREE 7.
 44:@FREE 8.
 45:@FREE 9.
 46:@FREE 10.
 47:@FREE 11.
 48:@FREE 88.
```

Figure III.19.2

UNCLASSIFIED•••EXAMPLE OF THE OUTPUT OF UTILITY ITMID/REC-A•••UNCLASSIFIED

```
  1: A03198 AK VEH M218 GM EG P1A            U 522 30 0 1 2   1
  2:      54      64      44      58      78      88      98
  3:  .00   .00   .00   .80   .20
  4:  .00   .00   .00   .80   .20
  5:  .00   .00   .00   .80   .20
  6:  .00   .00   .00   .80   .20
  7:  .00   .00   .00   .80   .20
  8:  .00   .00   .00   .80   .20
  9:  .00   .00   .00   .75   .25
 10: A14752 ADAP TEST CAMERA LM178           01636 30 0 1 2   2
 11:      10      16      16      17      17      17      17
 12:  .00   .00   .20   .80   .00
 13:  .00   .00   .20   .80   .00
 14:  .00   .00   .20   .80   .00
 15:  .00   .00   .15   .85   .00
 16:  .00   .00   .15   .85   .00
 17:  .00   .00   .35   .65   .00
 18:  .00   .00   .35   .65   .00
 19: A22496 AIMING CIRCLE M2 W/E             01636 30 0 1 2   3
 20:   6615   6699   8820   8823   8823   8823   8978
 21:  .25   .25   .50   .00   .00
 22:  .25   .25   .50   .00   .00
 23:  .25   .25   .50   .00   .00
 24:  .25   .25   .50   .00   .00
 25:  .25   .25   .50   .00   .00
 26:  .25   .25   .50   .00   .00
 27:  .25   .25   .50   .00   .00
 28: A23770 AIR COND FL/WNDW 60008           01833 30 0 1 2   4
 29:       0       0       0       0       0       0       0
 30:  .00   .00   .00   .00   .00
 31:  .00   .00   .00   .00   .00
 32:  .00   .00   .00   .00   .00
 33:  .00   .00   .00   .00   .00
 34:  .00   .00   .00   .00   .00
 35:  .00   .00   .00   .00   .00
 36:  .00   .00   .00   .00   .00
 37: A23828 AIR COND F/WA 9000 BTU           01833 30 0 1 2   5
 38:    889     993     998     998     998     998     998
 39:  .00   .00   .25   .25   .50
 40:  .00   .00   .25   .25   .50
 41:  .00   .00   .25   .25   .50
 42:  .00   .00   .25   .25   .50
 43:  .00   .00   .25   .25   .50
 44:  .00   .00   .25   .25   .50
 45:  .00   .00   .25   .25   .50
 46: A24044 AIR COND 18000 BTU               01833 30 0 1 2   6
 47:      53      53      53      55      55      55      55
 48:  .00   .00   .00   .50   .50
 49:  .00   .00   .00   .50   .50
 50:  .00   .00   .00   .50   .50
 51:  .00   .00   .00   .50   .50
 52:  .00   .00   .00   .30   .70
 53:  .00   .00   .00   .30   .70
 54:  .00   .00   .00   .30   .70
 55: A24318 AIR COND 18000 BTU               01833 30 0 1 2   7
 56:      15      25      42      57      63      83      97
 57:  .00   .00   .25   .75   .00
```

Figure III.19.3

UNCLASSIFIED•••EXAMPLE OF RATES-XX/MONTHLY-WOL OUTPUT DATA FROM UTILITY FLCON/3

1:	AD3198	AK VEH M218 GM FQ P1A	2.43	3.21	2.85	2.48	3.14	3.11	2.28	3.03	2.95	2.80
2:												
3:	A14752	ADAP TEST CAMERA LM178	8.04	10.65	9.64	9.79	10.48	10.26	8.08	7.06	10.00	8.47
4:												
5:	A22496	AIMING CIRCLE M2 W/E	30.73	40.37	35.58	39.79	49.34	46.76	21.56	18.44	42.10	28.86
6:												
7:	A23770	AIR COND FL/WNDW 6000B	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
8:												
9:	A23828	AIR COND F/WA 9000 BTU	1.15	1.77	1.49	1.44	2.14	2.10	.95	.87	1.69	1.31
10:												
11:	A24044	AIR COND 18000 BTU	.60	.74	.67	.47	.83	.74	.33	.47	.66	.51
12:												

Figure III.19.4

UNCLASSIFIED***EXAMPLE OF THE AMES-XX/MONTHLY-VL OUTPUT DATA FROM ELCON/3

1:	A03198	AK VEH M218 GM EQ P1A	2.89	8.52	5.94	3.27	11.82	6.57	3.15	3.31	7.18	4.21
2:												
3:	A14752	ADAP TEST CAMERA LM178	9.70	24.23	18.63	13.13	17.44	12.51	9.14	7.84	16.54	9.77
4:												
5:	A22496	AIMING CIRCLE M2 W/E	37.08	49.58	43.34	57.60	73.84	56.98	24.38	20.51	59.07	33.28
6:												
7:	A23770	AIR COND FL/WNDW 6000B	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
8:												
9:	A23828	AIR COND F/WA 9000 BTU	1.36	5.25	3.41	1.98	3.13	2.49	1.06	.94	2.89	1.47
10:												
11:	A24044	AIR COND 18000 BTU	.71	.87	.79	.62	2.31	.88	.37	.50	1.21	.58
12:												

Figure III.19.5

```
UNCLASSIFIED***EXAMPLE OF THE OUTPUT FROM UTILITY FINAL/REPORT***UNCLASSIFIED

    1:                              DAILY ATTRITION RATES
    2:
    3: TEMPORARY CONTROL DATA FILE WARF P88(12DEC
    4:
    5:
    6:
    7:
    8: NPER   MXITM   # CEM CLASSES   #WARF SETS
    9:    7       6          9              10
   10:
   11:
   12: DAYS PER PERIOD
   13:   15    15    30    30    30    30    30
   14:
   15:
   16: FIRST AND LAST PERIOD FOR EACH WARF SET
   17:    1     1
   18:    2     2
   19:    1     2
   20:    3     3
   21:    4     4
   22:    5     5
   23:    6     6
   24:    7     7
   25:    1     4
   26:    5     7
   27:
   28:
   29: AIR LOSS RATE BY PERIOD
   30:   .050   .050   .050   .010   .010   .000   .000
   31:
   32:
   33: SEA LOSS RATE BY PERIOD
   34:   .150   .150   .230   .100   .050   .020   .000
   35:
   36:
   37: LOC LOSS RATE BY PERIOD
   38:   .150   .150   .100   .100   .050   .050   .050
   39:
   40:
   41: AVERAGE LARGE UNITS BY PERIOD
   42:  48.10  51.50  52.00  52.00  52.00  52.00  52.00
   43:
   44:
   45: FRACTION OF FORCE BY POSTURE BY PERIOD
   46: ATTACK   DEFEND   WITHDRAW   INACTIVE
   47:  .0000   .1410      .0590      .8000
   48:  .7550   .1450      .0500      .6000
   49:  .2000   .1550      .0050      .6400
   50:  .1000   .0550      .1050      .8400
   51:  .0050   .0550      .1400      .8000
   52:  .3050   .0050      .0000      .6900
   53:  .5550   .0000      .0000      .4450
   54:
   55:
   56: ARTY KILLS (% PER DAY) BY VULN CLASS BY POSTURE
   57:
```

Figure III.19.6

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UNCLASSIFIED***EXAMPLE OF THE OUTPUT FROM UTILITY FINAL/REPORT***UNCLASSIFIED

   .000    .994    .211   1.666    .222    .111    .666    .098    .138    .899    .574
   .224    .691    .264    .719    .999    .744    .359    .807    .644    .921    .100

   .100    .992    .600   2.744    .578    .000    .299    .000    .704    .000   2.192
 7.682   3.339    .668   1.750   1.199    .502    .078    .515    .597    .000    .000

   .200   2.907   1.254    .927    .494    .000    .633    .000    .283    .284   1.609
 6.753   3.355    .895   3.001   1.678   1.789    .965    .898    .566    .000    .090

   .050    .255    .064    .555    .888    .010    .088    .550    .823    .760    .064
 3.142   7.460    .533    .850    .973    .369    .077    .050    .778    .000    .000


ARTY SCALNG FACTORS BY PERIOD
   .649    .764    .980   1.000    .950    .485    .196

CEH KILLS (% PER 30 DAYS) BY CLASS BY PERIOD

 64.000  1.400    .000    .000  10.000  24.000  36.000  72.000   7.800

 56.000  1.400    .000   2.000  20.000  34.000  52.000  60.000   4.200

 50.000   .900    .000   2.000  15.000  24.000  37.000  28.000   2.300

 27.000   .500    .000    .000   6.000  18.000  25.000  10.000    .600

 19.000   .400    .000    .000   5.000  13.000  16.000   4.000    .500

 30.000   .300    .000   4.000   4.000  14.000  33.000   3.000    .100

 17.000   .100    .000   2.000   3.000   7.000  15.000   1.000    .100



                DAILY ATTRITION RATES WITHOUT AND WITH LOB      LOSSES

LIN    NOMENCLATURE                              1STI5    2NDI5    1ST30    2ND30    3RD30    4TH30    5TH30    6TH30

AQ7198 AK VEH M218 GM EB P1A          W/O L   .08      .11      .10      .08      .10      .10      .08      .10
                                      W  L   .10      .28      .20      .11      .39      .22      .11      .11
                                AVE QTY       59.0     54.0     69.0     51.0     68.0     83.0     88.0     98.0

A14752 ADAP TEST CAMERA LM178         W/O L   .27      .36      .32      .33      .35      .36      .27      .24
                                      W  L   .32      .81      .82      .96      .58      .42      .30      .26
                                AVE QTY       13.0     16.0     13.0     16.0     17.0     17.0     17.0     17.0

A22496 AIMING CIRCLE M2 W/E           W/O L  1.02     1.35     1.19     1.73     1.64     1.56      .72      .61
                                      W  L  1.24     1.65     1.44     1.92     2.46     1.90      .81      .68
                                AVE QTY    6657.0   7759.0   7717.0   8821.0   8823.0   8823.0   8900.0   8978.0

A23770 AIR COND FL/WNDW 60000 B       W/O L   .00      .00      .00      .00      .00      .00      .00      .00
                                      W  L   .00      .00      .00      .00      .00      .00      .00      .00
                                AVE QTY       .0       .0       .0       .0       .0       .0       .0       .0

A23820 AIR COND F/WA 9000 BTU         W/O L   .04      .06      .05      .05      .07      .07      .03      .03
                                      W  L   .05      .18      .11      .07      .10      .08      .04      .03
                                AVE QTY     991.0    995.0    993.0    998.0    998.0    998.0    998.0    998.0

A24044 AIR COND 18000 BTU             W/O L   .02      .02      .02      .02      .03      .02      .01      .02
                                      W  L   .02      .03      .03      .02      .08      .03      .01      .02
                                AVE QTY      53.0     53.0     53.0     54.0     55.0     55.0     55.0     55.0
```

Figure III.19.6 (cont.)

Appendix A

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Appendix B

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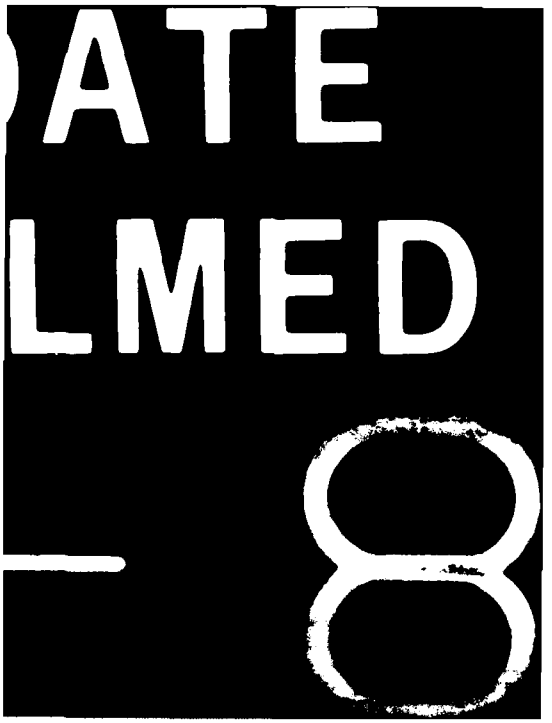
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